MARCH 1950

National Safety News

1950 ANNUAL SAFETY EQUIPMENT ISSUE

NOW PORTABLE VENTILATOR

M·S·A PORTABLE VENTILATION EQUIPMENT

Compressed Air or Steam Operated Type

The M.S.A.-LAMB AIR-MOVER converts efficiently the pressure of compressed air or steam into very large, induced volumes of air. Light, quickly set up, no moving parts.

Capacities of from 250 CFM to over 7,500 CFM with the following models:

Cat. No. DF-32119—MSA-Lamb Air-Mover 3" Model

Cat. No. DP-32120—MSA-Lamb Air-Mover 6" Model

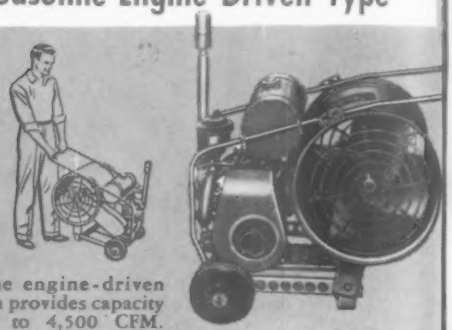
Cat. No. DP-33552—MSA-Lamb Air-Mover 10" Model

Special Purpose Ventilator

Complete in itself, requiring no vents to outside air, the M.S.A. WELDING FUME EXHAUSTER both exhausts and filters contaminated air at the welding point. Constant flow of approximately 80 CFM; used with rods up to 5/16" diameter.

Cat. No. CU-44914—MSA Welding Fume Exhauster complete with 12-foot metal hose, for operation on 115 volts AC/DC. Available also with 220-volt motor.

Gasoline Engine Driven Type

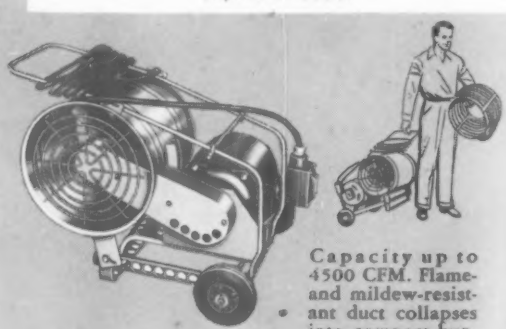


The engine-driven fan provides capacity up to 4,500 CFM. This unit is equipped with collapsible canvas duct to convey air to desired point.

Cat. No. CU-33953—MSA Portable Ventilator with Gasoline Engine and 16' of 14" diameter collapsible duct.

Electric Motor Driven Type

Explosion Proof



Capacity up to 4500 CFM. Flame- and mildew-resistant duct collapses into compact bundle for carrying.

Cat. No. CU-33954—MSA Portable Ventilator with explosion-proof motor Class I Group D and 16' collapsible duct for operation on 115 volts 60 cycle AC.

Cat. No. CU-33955—Same as CU-33954 except for operation on 230 volts, 60 cycle alternating current.

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS · PITTSBURGH 8, PA.

At Your Service:

54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

MSA SAFETY EQUIPMENT HEADQUARTERS

NATIONAL SAFETY NEWS

Published monthly by the National Safety Council

MARCH, 1950 Vol. 60, No. 3

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BILL ANDREWS, *Editorial Director* CARMAN FISH, *Editor*
NORVAL BURCH, *Associate Editor* ROBERT L. MEYER, *Associate Editor*
C. H. MILLER, *Advertising Manager* RALPH MOSES, *Art Director*

National Safety Council
20 North Wacker Drive
Chicago 6, Illinois

New York Office—800 Chrysler Bldg., New York 17. Western Office—111 Sutter Street, San Francisco

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54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

NATIONAL
SAFETY NEWS

MARCH, 1950

WHERE TO BUY IT

THIS issue, our Fourteenth Annual Safety Equipment Issue, will be a helpful buyers' guide for the next twelve months.

In addition to the information contained on the editorial pages and in the display advertisements, the reader will also find the classified section helpful. Here in convenient form is a guide to many types of products. Information on products not listed will be furnished by the National Safety Council on request.

Manufacturers and dealers also welcome inquiries on special problems as well as for standard equipment.

OBLIGATION AND OPPORTUNITY

MODERN management believes that industry has an obligation to its employees and to the public that goes beyond providing jobs and paying wages. The company must also be a good citizen and a good neighbor.

The plant must be "a good place to work." Employees may differ in their emphasis on the various factors that make up satisfactory employment, but safety and health are well up on the list. Danger as a condition of employment is no longer accepted complacently by either management or employees.

Safety, as we now understand it, goes considerably beyond the prevention of accidents and the diseases attributed to occupation. The workplace must be comfortable and pleasant as well as free from avoidable hazards.

Prevention of fatigue, both physical and mental, is an important objective and one that involves many angles of employment as well as off-the-job conditions.

More and more, working conditions are brought under control. Light, temperature and humidity can be regulated. Often the primary reason is for the benefit of the product although working conditions are also improved.

Measures for the reduction of noise, removal of dust and odors, mechanized methods of handling materials are being extended. Facilities for personal cleanliness, food service, and other employee services are receiving more attention in industrial planning.

Factories are becoming more attractive inside and out, with good effects on both employee and public relations. Color is being used extensively, both for decorative effect and for its functional uses.

The importance of these basic factors in industrial design and planning is becoming better understood, and safety is being built into more plants and machines.

Any equipment that helps to make the job safer, more healthful or more pleasant is safety equipment.

SUPPLEMENTARY READING

The material presented in these pages has been condensed, as is necessary in any reference work. The references included in each of the seven sections will furnish a guide to sources of more detailed information.

Conspicuous among the publications listed are those of the National Safety Council. These include Safe Practices Pamphlets, Health Practices Pamphlets, and Data Sheets. These present concise practical information on many phases of equipment, organization and administration. Lists of these and other publications will be furnished on request.

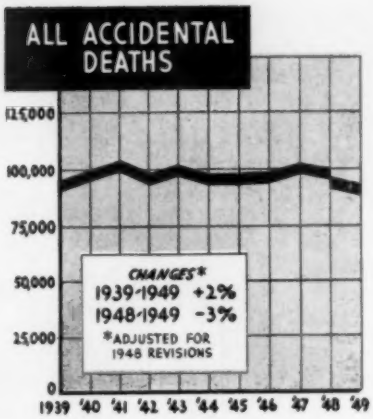
A compact volume of essential safety information is the Council's *Accident Prevention Manual for Industrial Operation.*

Also valuable in planning and conducting a comprehensive safety program are publications of the United States Department of Labor, state industrial commissions, insurance companies, and the American Standards Association.

Trade and technical magazines are also indispensable in the safety library. In addition to those in the safety field it is desirable to include publications covering the industrial field in general as well as those devoted to specific industries.

And don't overlook the catalogs and handbooks issued by manufacturers.

Safety Gains on All Fronts in 1949



THE 1949 occupational accident death total was approximately 15,000, a decrease of 1,000 from the revised 1948 total of 16,000.

The largest industry decrease was in coal mining. According to reports from the U. S. Bureau of Mines, there were over 400 fewer deaths in 1949 than in 1948. This was partially the result of a reduction in man-days worked, but data for the first half of the year alone showed a decrease of about 150 deaths from the same months of 1948.

Nonfatal injuries also decreased in 1949. The estimated total was approximately 1,850,000, compared to 2,000,000 in 1948—a 7½ per cent drop. Permanent impairments numbered about 80,000, or 10,000 less than in 1948.

Employment in all industries during 1949 averaged about 1 per cent less than in 1948. Manufacturing employment alone decreased 7 per cent.

Accident rates cannot be computed at this time on a national basis, but rates in accident prevention contests furnish an indication of probable trend. The average eleven-month frequency rate (disabling injuries per million man-hours) in seven sectional contests conducted by the National Safety Council was 6.94 in 1949, or 18 per cent less than the 1948 comparable rate of 8.51. In the interplant contests conducted by community safety councils the eleven-month 1949 rate was 9.25, a 21 per cent drop from 1948. In these contests the severity rate (time charges in days per thousand man-hours) of 0.63 was 10 per cent less than the 1948 rate.

Accident Costs

Wage loss, medical expense, and the overhead cost of insurance for occupational accidents in 1949 amounted to about $1,300,000,000. The so-called "indirect" costs totalled approximately $1,300,000,000, including such items as time lost by workers other than the injured, interference with production schedules, property damage, and partial disability due to accidents which did not result in lost time. Total costs thus were about $2,600,000,000.

Off-the-Job Accidents

In addition to the occupational accidents, the nation's productive capacity was lowered by off-the-job accidents of workers. The 1949 death toll from these accidents was approximately 30,500 and the injury total about 2,450,000. Accidents to workers, on and off the job, thus totalled 45,500 deaths and 4,300,000 injuries. The time lost during the year from these accidents, and from less serious injuries and indirect losses, amounted to approximately 400,000,000 man-days.

Industrial Commission Records

Deaths reported to Industrial Commissions in 26 states during 1949 totalled 7,392, or about 11 per cent fewer than were reported in 1948. Decreases of 6 to 39 per cent were recorded in 22 states, no change in one state, and increases of 6 to 24 per cent in 3 states.

	1949	1948	Change
Totals for 26 states	7,392	8,282	—11%
Alabama	96	130	—26%
Arizona	64	98	—35%
California	828	781	+ 6%
Connecticut	51	69	—26%
Florida	160	191	—16%
Georgia	112	129	—13%
Idaho	82	93	—12%
Illinois (10 Months)	232	290	—20%
Kansas	82	85	— 4%
Kentucky	76	125	—39%
Maine (10 Months)	24	37	—35%
Maryland	122	136	—10%
Massachusetts	454	452	0
Missouri	76	81	— 6%
Nebraska	66	86	—23%
New York (10 Months)	1,212	1,328	— 9%
North Carolina	126	112	+13%
Ohio	1,031	1,099	— 6%
Oregon (11 Months)	118	132	—11%
Pennsylvania	891	1,085	—18%
South Carolina	83	67	+24%
Texas	569	599	— 5%
Virginia	177	209	—15%
Washington	205	244	—16%
West Virginia	311	459	—32%
Wisconsin (11 Months)	144	165	—13%

Railroad Accidents

Deaths of railroad employees on duty, excluding those occurring more than 24 hours after the injury, numbered 301 in the first nine months of 1949, a decrease of 29 per cent from 1948. Injuries with more than three days' disability numbered 17,126, or 27 per cent less than in 1948.

Fire Loss

The 1949 total of property destroyed by fire was about $668,000,000, according to the National Board of Fire Underwriters. This was 6 per cent less than the comparable 1948 total. In 1948, over half of the loss from building fires was in industrial and business establishments.

THE NATIONAL ACCIDENT FATALITY TOLL

	Sixth Revision, International List of Causes of Death*		Change	Fifth Revision of List*
	1949	1948		1948
All Accidents	91,000	94,000	—3%	98,001
Motor-vehicle	31,500	32,259	—2%	32,259
Public non-motor-vehicle	16,000	16,500	—3%	17,000
Home	30,500	31,500	—3%	35,000
Occupational	15,000	16,000	—6%	16,000

Note: The motor-vehicle totals include some deaths also included in the occupational and home totals. This duplication amounted to about 2,000 deaths in 1949, and 2,200 in 1948. The 1948 Fifth Revision all-accident and motor-vehicle totals are National Office of Vital Statistics figures. All others are National Safety Council estimates.

*On January 1, 1949, the Sixth Revision of the International Statistical Classification of Causes of Death, adopted by vital statistics authorities in many countries, became the official method used in the United States. This Revision incorporates certain changes in methods of classifying deaths which result in many deaths of old persons formerly attributed to accidental injuries being classified to diseases.

In this table the 1948 figures are classified according to both the Fifth and Sixth Revisions, in order to show the size of the change made in the accident totals. The Fifth Revision figures are comparable with those for earlier years; the Sixth Revision figures, with those for 1949.

the industrial safety panel

discusses the Safety Department's part in

Building for Safety

THE QUESTION:

What part does your safety department play in planning basic plant improvements?

THE PARTICIPANTS:

GLEN D. CROSS, Safety Director, The Firestone Tire & Rubber Company, Akron, Ohio.

GERARD O. GRIFFIN, Director of Safety, Dravo Corporation, Pittsburgh, Pa.

F. W. KELSEY, Supervisor of Safety and Welfare, Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

J. L. RIDINGER, Director, Safety and Plant Protection, Inland Steel Company, East Chicago, Ind.

WILLIAM S. SMITH, Safety Director, Ford Motor Company, Dearborn, Mich.

GEORGE H. STEEL, Safety Director, Ralston Purina Company, St. Louis, Mo.

E. CLARK WOODWARD, Safety Director, A. O. Smith Corporation, Milwaukee, Wis.

SUMMARY:

The basic improvements covered in this month's question include matters of plant design and layout, handling materials, ventilation, light, and personal service facilities. They are as essential to operating efficiency as they are to a safe, healthful and pleasant and working environment.

In planning such installations, where does the safety department fit into the picture?

In the modern industrial corporation, the safety director is a valued consultant whenever new construction or installations are being planned. Many a company has found that safety features included at the planning stage have prevented hazards that could be corrected later only at considerable expense.

Initiative for improvements frequently comes from the safety department.

Cooperation with various departments brings varied knowledge and experience to bear upon problems, making plants safer and better places to work.

The safety department should be more than a mere censoring agency. Rigid requirements for safety department approval of all projects may invite buck passing.

Making other departments safety-minded should be the aim of the safety director.

MR. CROSS:

Some years ago, it was often necessary in our plants for the safety department to call certain unsafe conditions or conditions dangerous to the health of employees to the attention of the engineering department soon after new installations had been made. To correct such conditions, it was necessary to spend large amounts of money that could have been saved had the questions been considered in the blueprint stage.

Our Engineering Department, for the most part, now calls to our attention any proposed changes that have to do with materials handling methods, ventilation, employee service facilities, layouts of exits and aisles, lighting, and similar facilities affecting the health and safety of employees.

Approval is placed on blueprints and later, when the installation is completed, a signed approval form by the safety department is given to the engineer. Major recommendations are made in the blueprint stage and minor recommendations may be made to the engineer while the installation is being completed.

Close cooperation between the safety department and the engineering department is necessary to make any plan work satisfactorily. The safety department should have enough knowledge of engineering principles to make sound recommendations and thereby gain the respect of the engineering department. On the other hand, the engineering department should be open for suggestions.

MR. GRIFFIN:

On all major jobs which Dravo Corporation's two construction divisions perform, the divisional safety director, and sometimes the corporation director of safety, are invariably consulted during the preliminary planning stage. Sometimes, if unusual problems or hazardous situations are encountered, they are called in prior to the submission of a bid or to assist in its preparation.

More frequently, the general superintendent discusses with the safety supervisor, often in the presence of the man who will be job superintendent, the problems of the general layout of the project, location of temporary buildings and storage yard and access to the job. The latter includes crossing the railroad, which always seems to be involved, and parking space for employees.

Fire prevention and fire protection are thoroughly discussed. First aid provisions are also considered—will the job need a first-aid man, a registered nurse, or a full or part-time physician?

After a job is under way, the job superintendents are quite faithful about conferring with the safety supervisor regarding major changes in the plan of operations. The safety supervisors are naturally expected to be alert for possible changes and to anticipate them.

In addition, we have a system of approvals for the purchase of equipment or making improvements when the expenditure amounts to more than $500. Copies of these authorizations come to the director of safety and served as a check on contemplated major changes.

MR. KELSEY:

The chairman of our board of directors has stated: "The most valuable asset of our corporation is the men and women who do its work. We accomplish our objectives through the medium of human beings, and the efficiency with which we utilize our most valuable asset is a significant measure of the efficiency of our operations.

"For humanitarian and sociological reasons, we have an obligation to be sure **that the conditions under which our employees work are as safe as any that human ingenuity can devise.**"

This statement by the head of our corporation stands as a very definite challenge, not only to the safety department, but to every supervisor within the corporation. It requires that the safety department play an important part in building safety into all basic plant improvements. This is accomplished by working closely with the engineering, construction, maintenance and operating departments in regard to all proposed developments or changes in old installations, in order to make certain that the health, welfare and safety of employees are provided for.

As a result of close cooperation between these departments, our plants are much safer and better places in which to work than they otherwise might be. This is demonstrated by better and safer roads and walkways; better housekeeping; improved heating and ventilating facilities; adequate and better equipped employee service facilities; establishment of standard clearances; better guarding; safer and better means for handling material and equipment. These accomplishments are brought about as the result of day to day contacts by representatives of the safety department with the departments involved.

MR. RIDINGER:

We have the complete cooperation of top management and the engineering department whenever basic changes are to be made in operations. While plans are still in the drawing board stage, the safety and medical departments are contacted regarding problems involving health and safety. From time to time we are confronted with new problems which involve considerable research.

We do not consider the job done after it reaches the blueprint stage because frequently special safeguards are required during the period of construction. Before testing new operations it is important to see that the necessary mechanical and electrical safeguards are installed. Workers must be provided with proper wearing apparel. If the installation involves contaminating the air, even though exhaust systems are used, air samples are taken to determine the effectiveness of the exhaust system.

MR. SMITH:

The safety department keeps in close contact with the plant engineering, industrial hygiene and material handling departments.

All new plant layouts are studied with the plant engineer and his staff: First, in the blueprint stage the safety department studies plant layout proposals for safety factors; second, during installation a close inspection is made to see that everything goes in according to safety standards, and third, the final and important point is to make a thorough inspection when operation begins.

The above refers to both the inside and outside of buildings. It includes both new equipment and existing equipment which is being rearranged. For example, cranes, elevators and miscellaneous hoisting equipment would require attention from the safety standpoint. Close attention is paid to the location of storage tanks and railroad switching operations.

Material handling and safety departments work together on the following important factors:

1. Safe design and operation of industrial trucks.
2. Control of gasoline supply and battery charging units to service trucks.
3. Issuing of permits for operators.
4. Close check on floor loads.
5. Loading box cars relative to ramps between car and loading dock and special loading and unloading devices in the cars.
6. Checking to make sure that industrial trucks are not misused.

—*To page 137*

THE INDUSTRIAL SAFETY PANEL is an informal group representing various branches of industry. Each month part of its membership discusses some question relating to accident prevention principles and methods. The Panel is conducted by mail and participants have no opportunity to compare notes.

Personal views of members are invited. Statements presented here may or may not be expressions of company policy.

The limited sample of opinion presented in the Panel inevitably leaves some angles of the subject uncovered. Comments of readers will be welcomed for publication, also topics you would like to have discussed by the Panel.

the LIGHTER SIDE
KEEP HANDS IN PLACE
I JUST HAD TH' PANTS SCARED OFF ME, BOSS!
SID HIX
JOE SHOULD HAVE HAD THAT WALL PAINTED AN HOUR AGO — WHAT'S HOLDING HIM UP?
A MAN OF EXTINCTION IS WALDEMAR GOFF, WHO OILED A MACHINE WITHOUT TURNING IT OFF!

A SALESMAN TELLS OFF SAFETY MAN

By BILL ANDREWS

(Fiction)

New readers of the **Diary** *may not know Max. He has appeared in several installments and was the subject of one whole installment (March, 1948). The safety director of Jackson-Barnes has described him as "a jobber's representative with a mixed safety equipment line . . . Also, the best safety inspector I ever saw."*

Fictional characters are, as any author will tell you, every bit as sensitive as real people. And Max is outraged at some of the things that have been written about him. He demands publication of his counter-attack, and we haven't the heart to refuse him.

MY name is Max, and there have been a lot of things written about me in the NATIONAL SAFETY NEWS by my friend, the safety director of Jackson-Barnes (the dog). He made me a kind of comic-opera, Viennese model, genius-clown-glutton combination. It was not a nice thing to do.

So, in revenge, I want to tell you some things about safety directors—and about that safety director in particular—as they look to an equipment salesman like me.

One type of safety director I have trouble with is the "education-is-everything" man. He thinks that if he only makes enough speeches, runs enough contests, and thinks up enough cute stunts, all the workers will reform themselves into angels. Then there is no need to buy any guards or goggles or safety shoes. There is, he thinks, no need to make laborious surveys of hazards and undertake those unpopular campaigns to persuade the boss to spend some money.

I'm not, believe me, arguing against education. My prettiest guards and my toughest protective equipment won't stop any accidents if they aren't used. But I think—honestly and not just because I am a peddler—that it is easier to educate a man enough to keep him safe behind a screen of good equipment than it is to train him to be safe in the presence of unguarded hazards.

Another type of safety director is the "O-my-God-a-crisis" boy. He believes in safety equipment, all right. He believes in it with deep fervor—especially when he has just investigated an accident. All of a sudden, he is on the phone, screaming to me to ship him a lot of stuff tomorrow, air express, expense-no-object. But when an accident or an article or a speech hasn't waked him up, he doesn't even think about trying to figure out what he needs. I call on him and show him things, but he won't listen. Then, maybe just after I've left, he wants fifty hard-to-get items instanter, and if I don't find them at once, I'm no good.

If he would only think his problem out, or let me and my competitors help him think it out, he could plan a program of procuring what he needs in orderly fashion, let us shop for a bargain for him, let us keep our standards high. But what's more important, he'd be able to procure what he needs most first, and not go stampeding off in an endless rat race to try to prevent yesterday's accidents with the equipment that will be delivered next week.

Then there's the "I-know-what-I-want" fellow. He is often a pretty smart sort of guy. He takes notes at National Safety Congresses, picks up lots of literature from people like me, reads it, and then puts out his requisitions without talking to the peddlers. Now that's good, in one way. It cuts sales costs for us. But I'm conceited enough to think maybe I could help him if I could study his problem. Sometimes, a piece of equipment is perfect in one situation, but only second best in another. So the know-it-all often is paying for first-rate equipment that to him will only be second-rate.

I—or even some of my competitors, the dogs—could visit with him, look his plant over, bull around, buy him a dinner, and save him money—even maybe some eyes or lives. But this type just won't listen.

His exact opposite is the "I-can't-make-up-my-mind" safety director, who is cheating his boss every time he draws his paycheck. He either doesn't know his stuff, or he is so unsure of what he does know that he depends on the salesman to do his whole equipment-procurement planning.

This, too, has its compensations for us. But we peddlers are human, and if we have to do all the work, we expect to get paid. And maybe, sometimes, we stick things in the requisitions to fill out our commissions a little. Not bad stuff, of course, not stuff he doesn't need. But still, maybe, the stuff that could wait, the stuff with a bit better mark-up.

One guy that annoys me is the mono-maniac. He is convinced that one type of accident is the whole story. So maybe he is a goggle man, or a safety shoe fanatic, or guard-happy, or paint-crazy, or any of a million

things like that. Me, I've stopped arguing with men like that. But underneath it worries me, because I know that he is hurting his plant and himself by refusing to balance out his program over the whole range of hazards. I even knew one man that was first-aid crazy—it almost seemed as if he didn't care how many people got hurt, if only he could patch them up quickly and well. I sold him more medical supplies!

I have some other dislikes, but that's a long enough list. Now let's talk about the no-good from Jackson-Barnes who has been writing about me.

Pumped Dry

Just as soon as he settled down into his routine at that plant, he called me in. Before he told me what he wanted, he took me over his set-up and pumped me dry of ideas. Such an inspection job I did for him! Then he went over my list of recommended purchases, and the low-life knocked off the list two of the slowest moving items in my line. He didn't give a hoot about the state of my inventories. He grabbed at what he wanted from my list, because the so-and-so is smart enough to recognize good ideas even if he didn't think them up. He chopped off every single item he didn't think his budget would stand at that time, in favor of things he needed more.

When he got through with that list, he brought out his own. He had seen in his months at the plant a lot of needs I'd missed in one day. Some of them he had set absolutely pat, with iron-clad specifications a bull-dozer couldn't have changed. Others he left wide open, asking my opinion on type and brand. Some things he wanted immediately. But he had others that he wanted delivered (and paid for) six months later.

Some things he wanted "at the market." On others, because the dog knows the market has soft spots, he wanted to bargain and haggle on price. He stuck hard for top quality where it made any difference, for economy where quality wasn't much of a factor.

And then, as a final insult, he went over the list again and threw some of the items out into a list for my worst competitor, who is not only a chiseling bum but also has better stuff than I do in some things.

I almost wept over his rank ingratitude. I could see commissions shrink and shrink the longer we talked.

But I take what comfort I can from the knowledge that this particular safety director is going to be giving me my share of his business for a good many years.

A lot of the guys in the other types were better customers once—but they aren't safety directors any more.

(To be continued)

J. E. Long, NSC Past President, Dies

JOHN E. LONG, a former president of the National Safety Council and a director since 1928, died suddenly at his home in Albany, N. Y., on February 4.

Mr. Long was born in New Scotland, Albany County, New York, October 28, 1883. Starting his railroad career with the New York Central in 1901, Mr. Long became interested in safety through his work with the law department in settling personal injury claims.

During World War I he was safety engineer for the Canadian National Railways, 1914-1918. From 1918 until his death he had been superintendent of safety for the Delaware & Hudson Railroad Corporation.

In 1918 the Delaware & Hudson became a member of the National Safety Council and Mr. Long became active in the Council's work. Throughout his life, the promotion of safety continued to be one of his major interests.

In 1926 he became secretary of the Railroad Section of the NSC, advancing to vice-chairman in 1927 and general chairman in 1928. In that year he was elected to the National Safety Council's Executive Committee (now the Board of Directors) and continued as a member of the Council's top policy-making body.

His broad and progressive attitude toward all safety problems was typified by his desire that the railroads and all industry extend their accident prevention effort to community, state and national programs. From 1930 to 1933 he was the Council's vice-president for Local Safety Councils. In 1933 he was elected president and served two terms.

John E. Long 1883-1950

He was a member of the American Society of Safety Engineers and served on the Society's executive committee for several years.

In Albany he was a leader in civic affairs, particularly in the Boy Scouts, first aid and Y.M.C.A. work.

Surviving are his widow, a son and a daughter.

Modern Man Victim Of Own Noise

Modern man has industrialized himself to the point where occupational deafness, shattered nerves and wasted time and energy have forced him to do something about noise, says R. L. Leadbetter, of Libertyville, Ill., an authority on sound and its effects.

Man is becoming "acoustical conscious," Mr. Leadbetter said in a statement prepared in connection with the tenth anniversary of the National Noise Abatement Council. Mr. Leadbetter, who was for many years director of engineering for the laboratories of the Burgess-Manning Company, of which he is now vice president, added that the nation is fast becoming a victim of man-made din.

"His approach is announced by noise, whether he flies, rides the streamliner, or drives his car," Mr. Leadbetter pointed out. "Thirty per cent of the power in the fuel that goes into his engine goes out the exhaust in the form of hot, toxic, stinking gas and noise.

"In a large dining room without acoustical treatment a crowd presents an almost unbearable situation.

"The first glimmer of man's emergence from the darkness of primitive ignorance to the light of industrial development (we call it civilization) came with his discovery of the wheel. I'll wager the wheel squeeked and that it was a long time before he discovered what he could do with some bear's grease. The first acoustical expert eliminated the waste effort caused by friction that made the wheel squeak.

"Man has finally industrialized himself to the point where occupational deafness, shattered nerves and waste time and energy have forced him to do something about noise.

"The acoustical engineer has been able to reduce the engine exhaust noise to an energy level less than one per cent of what it would have been without exhaust quieting devices.

"Acoustically treated rooms have greatly reduced speech effort."

PROTECTIVE CLOTHING CHART

	Sparks	Hot Materials	Heat	Hot Liquids	Moisture	Acids & Alkalis	Slips & Falls	Falling Objects	Flying Particles	Electric Shock	Cuts & Abrasions	Dermatitis	Explosives	Machinery
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
HATS, CAPS HELMETS	X	X	X											
				X	X	X				X		X		
	X		X									X		X
								X	X		X			
	X							X	X	X	X			
COATS, APRONS WAIST PROTECTION	X	X	X											
	X	X		X					X		X			
				X	X	X				X		X		X
				X	X	X				X		X		X
									X		X			X
SLEEVES WRISTLETS	X	X	X											
	X	X		X					X		X			
	X	X	X						X					X
				X	X	X						X		
				X	X	X				X		X		
GLOVES, MITTENS HAND PADS FINGER GUARDS	X	X	X											
	X	X		X					X		X			
				X	X	X				X		X		
				X	X	X						X		
											X			
											X			
PANTS, KNEE PADS LEGGINGS	X	X	X											
	X	X		X					X		X			
	X	X	X						X					X
	X							X	X		X			X
				X	X	X						X		
				X	X	X				X		X		
SHOES, BOOTS								X			X			X
					X		X							
		X	X	X	X	X	X				X			
	X	X	X	X										
				X	X	X				X		X		
													X	

Asbestos
Plastic-Rubber
Cotton-Wool
Metal
Plastic

Asbestos
Chrome Leather
Plastic
Rubber
Canvas-Fiber

Asbestos
Chrome Leather
Flameproofed Duck
Plastic
Rubber

Asbestos
Chrome Leather
Rubber
Plastic-Rubber Coated Fabric
Metal Mesh
Cotton-Canvas

Asbestos
Chrome Leather
Flameproofed Duck
Fiber-Metal
Plastic
Rubber

Steel Toe Caps
Non-Skid Shoes
Wooden Soles
Chrome Leather
Rubber
Conductive Rubber

COMING EVENTS

In the Field of Safety

Mar. 20-21, Boston
Twenty-ninth Annual Safety Conference and Exposition. Edgar F. Copell, president, Massachusetts Safety Council, 31 State St., Boston 9, Mass.

Mar. 28-31, New York
Twentieth Annual Safety Convention and Exposition, Greater New York Safety Council. (Hotel Statler). Paul F. Stricker, executive vice-president, Greater New York Safety Council, 60 East 42nd Street, New York 17.

Apr. 5-8, Charleston, W. Va.
West Virginia Annual State-wide Safety Conference. W. C. Easley, managing director, West Virginia Safety and Health Council, 316-17 Masonic Bldg., Charleston, W. Va.

Apr. 11-13, Columbus, Ohio
Twentieth All Ohio Safety Congress and Exhibit. (Neil House). James H. Fluker, chairman; G. S. Kallenbaugh, congress manager, 65 South Front St., Columbus 15, Ohio.

Apr. 13, Bridgeport, Conn.
Fifth Annual Connecticut Industrial Safety Conference. Donald Ackley, c/o G. & O. Manufacturing Co., New Haven, Conn.

Apr. 12-13, Buffalo, N. Y.
Tenth Annual Western New York Safety Conference. (Hotel Statler). Eugene C. Hohlstein, c/o Buflovak Div., Blaw-Knox Co., 1543 Fillmore Ave., Buffalo, N. Y.

Apr. 18-20, St. Louis, Mo.
Central States Safety Conference. (Hotel Jefferson). Reyburn Hoffman, secretary-manager, The Safety Council of Greater St. Louis, 511 Locust Street, St. Louis, Mo.

Apr. 23-29, Chicago
American Association of Industrial Physicians and Surgeons, 35th Annual Convention. (Hotel Sherman). Dr. Edward C. Holmblad, 28 East Jackson Blvd., Chicago 4.

Apr. 23-29, Chicago
American Association of Industrial Nurses, Annual Conference. (Hotel Sherman). American Association of Industrial Nurses, Inc., Room 909, 654 Madison Ave., New York 21.

Apr. 24-25, Toronto, Ont.
Annual Convention, International Accident Prevention Associations. (Royal York Hotel). R. B. Morley, general manager, International Accident Prevention Associations, 600 Bay St., Toronto 2, Canada.

May 2-4, Chicago
Twenty-seventh Annual Midwest Safety Show. (Hotel Sherman). Joseph F. Stech, manager, Greater Chicago Safety Council, 10 North Clark Street, Chicago 2.

May 2, Allentown, Pa.
Twenty-third Annual Eastern Pennsylvania Safety Conference. Harry C. Woods, executive secretary, Lehigh Valley Safety Council, 602 East 3rd Street, Bethlehem, Pa.

May 3-5, Charlotte, N. C.
Twentieth Annual North Carolina Statewide Industrial Safety Conference (Hotel Charlotte). H. S. Baucom, safety director, North Carolina Industrial Commission, Raleigh, N. C.

May 4-5, Baltimore, Md.
Maryland Safety and Health Conference and Exhibit. (Lord Baltimore Hotel). Joseph A. Haller, Director of Safety, State Industrial Commission, Equitable Bldg., Baltimore 2, Md.

May 18-19, Duluth, Minn.
Lake Superior Mines Safety Council, 26th Annual Conference. (Hotel Duluth). John A. Johnson, supervising engineer, U. S. Bureau of Mines, 18 Federal Bldg., Duluth 2, Minn.

June 1-3, Roanoke, Va.
Sixteenth Annual Virginia Statewide Safety Conference. (Hotel Roanoke). William M. Myers, managing director, Richmond Safety Council, Allison Bldg., Richmond 19, Va.

June 7-9, Pittsburgh, Pa.
Twenty-fifth Annual Western Pennsylvania Safety Engineering Conference. (William Penn Hotel). Harry H. Brainerd, executive manager, Western Pennsylvania Safety Council, Chamber of Commerce Building, Pittsburgh 19, Pa.

June 18-21, Boise, Idaho
Western Safety Conference. Paul V. Black, president, c/o Idaho Compensation Co., Boise, Idaho.

Oct. 16-20, Chicago
Thirty-eighth National Safety Congress and Exposition. (Stevens Hotel). R. L. Forney, general secretary, National Safety Council, 20 North Wacker Drive, Chicago 6.

VULNERABLE PARTS

The above chart showing frequency of injuries to various parts of the body through occupational accidents is based on a summary of accidents reported to ten state industrial commissions.

Titles of sections in bold face

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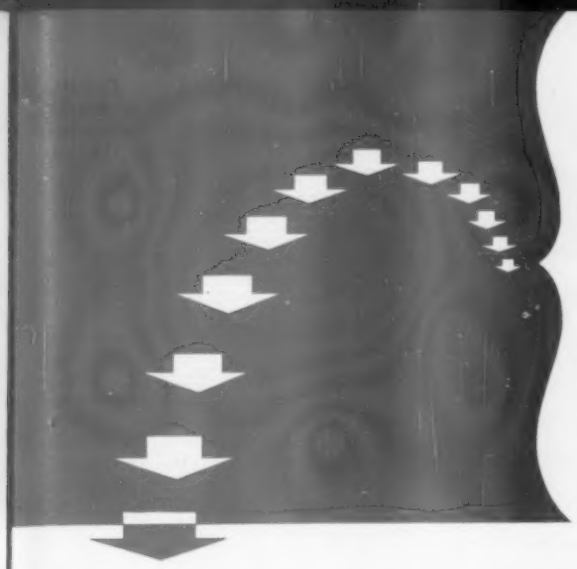

Section 1

DESIGN, CONSTRUCTION AND MAINTENANCE

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Planning the Safe Plant

BUILDING a factory used to involve little more than enclosing the required amount of floor space with four walls and a roof. The machinery and processes were made to conform to the allotted space. Such refinements as safety and hygiene and personal service facilities received slight consideration.

In sharp contrast, the modern plant is tailored to fit the operating processes of the company and, generally, to provide a safe, pleasant place to work. Most of the plants erected during the past ten years are pleasing architecturally, economical to maintain and efficient in operation.

Industrial construction, stimulated by war needs, has continued because of shifting population and markets, high transportation costs and the obsolescence of old plants which were not adaptable to straight line production methods. Many of the older buildings had floors which could not support heavy lift trucks and building frames restricted use of conveyors.

When a plant is in the blueprint stage, there are unequalled opportunities for incorporating features which increase operating efficiency and improve working conditions. Effective preplanning means less "corrective engineering" later on. To a lesser extent, similar opportunities are presented in remodeling.

Building Trends. High construction costs stimulate the search for more economical materials and methods. Many materials which meet exacting laboratory tests are often barred by local building codes. Work on standardization of building codes is being conducted by the American Standards Association and other organizations.

One-story plants have been growing in popularity where land values are reasonable and there is plenty of room for expansion. It is adaptable to landscaping—an asset where the plant is near a main highway or an airport.

Advantages of the one-story building are:

- Lower construction cost
- Freedom from stairs and elevators
- Ease in routing and handling heavy and bulky equipment
- Better lighting and ventilation
- Ease in isolating hazards
- More efficient handling of materials
- Easier supervision
- Lower operating and maintenance costs

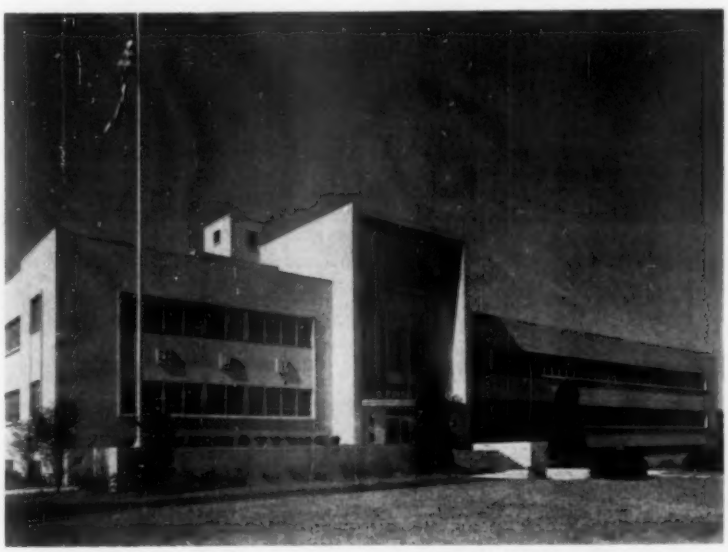
Keeping the roof flat, or with few projections, is an economy measure. Monitor and sawtooth construction are becoming less popular although sometimes they are specified to get daylight to the center of the building. Many companies believe that totally artificial light lowers employee morale and productive capacity.

The windowless plant with controlled conditions and the conventional type of plant both have their advocates and their advantages. The choice will be dictated by local conditions.

Preplanning. In planning layouts every operation should be envisioned and provided for. This can be done with increasing effectiveness by maps and drawings, block templates, 2-dimensional templates, and 3-dimensional scale models. Combinations of these methods are often employed.

With templates and scale models it is possible to study a manufacturing process quickly and easily, thus combining, changing the sequence of or simplifying the operations.

A layout with precision scale models (¼" to the foot) presents a



When a plant is near a residential neighborhood architecture and landscaping influence the public attitude. (The Austin Company).

Where flammable liquids are used every available safeguard must be incorporated in the building. This rubber cement factory is vapor sealed and has explosion panels in floor and roof. Building is air-conditioned and exhaust systems remove solvent vapors. (Turner Construction Company.)

3-dimensional picture of the plant. Various arrangements can be studied at slight expense.

Standards for templates and models are being developed by a committee of the American Society of Mechanical Engineers.

General Factors

Regardless of the type of building and the operations, state and municipal laws and regulations should be checked carefully. These may cover fire protection, exits, sewage disposal, highway traffic, etc.

Type of industry is the major factor in plant design and layout. Even plants in the same industry may have individual requirements that involve special planning. Fire and explosion hazards and material handling and storage are among these factors.

Public utility engineers can often give helpful advice to prospective industries in a community.

The site. Whether the ground is high or low, level or sloping, dry or swampy, or undermined must all be considered in the plans. Possibility of floods or washouts during heavy rains also must be considered. On ground likely to be flooded, one-story buildings have disadvantages. Even though the structure is strong enough to withstand the flood, it is not possible to move valuable equipment and products to upper floors.

Waste and sanitary sewer location is determined chiefly by location of buildings, lay of the land, and maintenance needs. Sufficient manholes or other openings for same maintenance should be planned.

Sewers should not be located where leakage might contaminate drinking water sources. In some instances it may be necessary to treat waste material before running it into streams or otherwise disposing of it. In other instances it may be necessary to install special sewerage systems. Federal as well as state and municipal laws may govern waste disposal.

Climate. Industries in colder regions have problems of ice and snow and keeping the plants warm, which may make ventilation complicated and expensive. In some parts of the country some material may be stored outdoors; in others, covered storage may be necessary.

Heavy roof loads of ice and snow and strong winds also affect building design. Where storms of cyclonic intensity are frequent, roof anchorage is important. Insurance companies have useful data regarding losses through windstorms and lightning in various sections of the country.

High prevailing winds also affect design and location of smokestacks.

Appearance. More attention is being given to the appearance of the plant—both inside and out. Community and employee relations are influenced by the looks of a factory and customers are apt to judge the product by the plant.

Landscaping should be planned for economical maintenance. With power mowers and sweepers a small force can take care of a large lawn if it is not broken up by shrubbery and flower beds.

Off-the-street parking. The parking lot is an important adjunct of today's plant and it should receive consideration in all plans. The employee car pool, which became popular during the war, continues to be a popular form of transportation, particularly in locations with inadequate public transportation systems. The lot should be located so that employees need not cross busy thoroughfares to reach it. Separate entrance and exit facilities should be provided.

Transportation. General facilities for moving materials in and out of the plant include railroads, highways, water and air. In some cases all types may be employed but more than two are seldom needed. Railroad sidings and roadways within the plant add some of the problems of railroading and highway traffic to manufacturing operations.

Work and Storage space. Space for the full needs of equipment and operators and for the movement and storage of materials should be provided.

Insufficient headroom is often a hazard. So-called "temporary" installations of pipe lines, equipment supports, overhead conveyors and other installations that might cause head bumps can often be avoided. Elevation drawings should be studied to determine the exact location of equipment that might cause trouble.

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Well maintained roadway in a steel mill. Note also well ballasted track and orderly appearance of buildings. (Bethlehem Steel Company).

Ventilation

Electrostatic precipitator eliminates oil mist in screw machine room and recovers cooling oil. Along with improved working conditions, additional benefits accrue from reduced maintenance. Operating head of screw machine is readily accessible as seen above with hood up and side panels removed. (Westinghouse).

CLEAN AIR at a comfortable temperature is an essential of good working conditions. It is necessary for both health and efficiency.

Air contaminants range from nuisance dusts, mists, vapors and gases to definitely toxic substances. Unpleasant odors, even though not dangerous, cause dissatisfaction and labor turnover.

Removal of the air contaminant at the source is recognized as the most effective method. When the offending substance becomes mixed with the workroom air, removal is much more difficult and costly.

General Ventilation

General ventilation is usually satisfactory in workplaces where there are no health hazardous processes or where dilution of the air contaminant will keep the concentration below the accepted limit for continuous exposure.

Ventilation is frequently complicated by the necessity of maintaining temperature at a comfortable level in the workroom. It is usually possible to exhaust the impure air but in cold weather the incoming air to replace it must be warmed.

Natural draft ventilation is adequate for some buildings and processes. Air circulation is secured by doors, windows, roof ventilators and monitors. The number of outlets should be planned for hot weather when the temperature difference including the draft is least.

Air intakes should be located so that incoming air is properly tempered and does not produce drafts in cold weather.

Artificial general ventilation requires properly located inlets and outlets. Air coming into the workroom must be uncontaminated and discharge points should be located to avoid recirculation of polluted air.

When the contaminant is heavier than air, openings at floor level should be provided to permit its escape.

Fans and Blowers. Both portable and stationary types are useful for increasing circulation of air and affording relief from heat. Their effectiveness decreases as temperature and humidity rise. They are not substitutes for exhaust ventilation where toxic materials are found.

Air Conditioning for Crane Cabs. Crane operators are often subjected to extreme conditions of heat and humidity as well as to fumes, odors and dust. A cab cooler is self-contained and supplies clean, cool dehumidified air. These units are designed to heat the cab in winter as well as cool it in summer.

Control Methods

When there is a definite air pollution problem, general ventilation alone is seldom effective. Three steps are involved in attacking the problem:

1. Identifying and locating the source of the offending substance.
2. Atmospheric sampling to determine the nature and degree of contamination.
3. Engineering measures to control pollution.

Control at the source may sometimes be achieved by operational changes involving substitution of process or materials. Usually, however, mechanical measures must be used.

Mechanical control involves one or both of these principles:

1. Isolation or enclosure of the hazardous operation.
2. Ventilation and exhaust systems.

By the first method, the operation is confined to a definite location and exposure of workers is either eliminated or restricted to a few specially selected, trained and equipped operators.

Examples of combining general or local exhaust ventilation with isolation and enclosure are: Sandblasting rooms, shake-out and tumbling barrel operations in foundries, dry mixing, and mixing of volatile liquids.

Processes creating excessive heat, humidity or noise should also be confined wherever possible. Personal protective equipment is needed where exposure is occasional or where complete protection has not yet been achieved. Removal of the hazard at the source should remain the objective.

Sanitation and housekeeping must receive constant attention; otherwise the best equipment will be relatively ineffective.

Supervision and training of employees, particularly in hazardous processes, is important and such workers should receive periodic physical examinations.

Local Exhaust Systems

Because numerous factors hinder the effectiveness of general ventilation, **local** exhaust systems should be used wherever the operation makes it desirable.

The design of ventilating equipment, is a problem for the expert. Frequently municipal and state regulations must be followed.

Use of local exhaust systems is

Vapor and fumes created during this cleaning and soldering operation are effectively carried away by these exhaust hoods.

probably the most important control measure. Properly designed hoods close to the point of origin of dusts, fumes or mists prevent their dispersal into the general atmosphere and direct them through a system of ducts to a safe point of discharge or collection. The engineering principles are relatively simple but application is not always easy.

An exhaust system consists of four major parts:

1. Hoods or enclosures at the point of generation of the contaminant.
2. Exhaust piping connecting the hoods into the system with a single discharge point.
3. The exhaust fan or other airflow producing equipment.
4. Air-cleaning equipment and final discharge.

Each part has its independent function but all must be designed to work together efficiently.

The exhaust hood is the most important part of the system and it should enclose the process as completely as possible. Air velocity decreases approximately with the square of the distance from an exhaust hood opening.

Air velocity required for effective control varies with the process and must be determined in each case. Generally speaking, the better the enclosure and design of the hood the less necessity for high velocities.

Effectiveness of existing hoods can be increased where the nature of the work will permit installation of flanges to increase the intake efficiency. Hoods or enclosures may be in the form of booths, canopies, lateral hoods, downdrafts through grill openings below the process, or slot type hoods which require a high velocity.

Exhaust ducts or piping connect the hood or several of them to the central exhaust fan, distribute the air flow in direct proportion to the requirements of each exhaust opening and to maintain adequate pipe velocity where necessary, to convey dust fumes, etc., to the final point of discharge.

The system should be balanced so each hood draws the proper amount of air. When this condition has been obtained, all means of adjustment should be permanently fixed. The areas of branch pipes and main ducts must be calculated to give the correct air velocities throughout the system.

For systems which transport material, this means that the area of the main duct must be about equal to the combined areas of all the branches.

Material used for ducts must resist abrasive action of dust or corrosive action of acids, gases and vapors.

Traps with clean-out gates should be provided at the bottom of vertical runs, and clean-out gates at regular intervals on the bottom side of horizontal runs.

Sharp turns in ducts must be avoided, as air under suction may lose considerable velocity at such points.

Air movements in the local exhaust system may be obtained by natural draft, exhaust fans, venturi ejectors, or by other means. Quite frequently when the operation can be provided with an effective enclosure type hood and the contaminant is hot and has a natural tendency to rise, natural draft or gravity ventilation is satisfactory.

Exhaust fans must be suitable for exposure to the abrasive or corrosive or explosive material collected, although the air-moving device can be largely protected from the material by installing it on the clean side of the collector.

Fans should have a capacity slightly in excess of the calculated requirement to allow for leakage in the system, for accumulation of material on the fan blades, and similar difficulties.

Disposal of Contaminants

Equally as important as collecting the air contaminant is its proper disposal. In many cases, as with gases, vapors and mists, these may be discharged to the general atmosphere at a point where they cannot readily reenter the premises.

Re-circulation of air from exhaust systems is not considered good practice. It is permissible, however, in case of relatively non-toxic material which can be efficiently and thoroughly removed from the exhaust stream by air-cleaning devices which are adequately maintained.

Several methods are employed to prevent the discharge of contaminants into the atmosphere. Condensation and absorption of vapors by some liquid is sometimes practicable. Gases may be scrubbed with jets of steam or water. Solvent oils in wash towers absorb some vapors.

If the vapor has economic value, it can be recovered from the solvent oil by fractionation; if not, it can be destroyed by burning.

Oxides, tar vapors, and resins may be collected by electrostatic precipitation and recovered. Some gases may be absorbed by silica gel, alumina gel, or activated carbon and recovered when the absorbers are regenerated.

Alkaline solutions may be used to wash acid mists from gases, and acid solutions to remove alkaline mists. However consideration must be given to the disposal of such solutions to prevent stream pollution or sewer damage.

Dust Arresters

Exhaust systems for toxic and harmful dusts should be provided with dust arresters or collectors. Dusts such as lead or silica should not be discharged to the open atmosphere where there is any possibility of their

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Methods of Sanitizing Eating and Drinking Utensils, Aug. 1944.

Light for the Job

Lighting installation for small parts assembly. Two-lamp 40-watt fluorescent units are mounted in continuous rows 10½ feet above the floor. Supplementary light is provided by single 30-watt lamps. Illumination on table tops is 250 footcandles. (General Electric Co.).

GOOD lighting creates a general brightness of the work area which is pleasing to the eye and minimizes the effort of seeing. It avoids both dimness and harsh contrasts of glare and shadow.

Lighting involves more than the fixtures; it takes in the whole illuminated environment. Lighter, brighter colors on walls, floors and machines reflect a higher percentage of light than the dark shades formerly used because they made lack of maintenance less conspicuous.

These factors, as well as the development of more efficient light sources, have made possible higher standards of lighting.

Light and Accidents. The importance of light in preventing accidents is seldom questioned, even though statistics on the proportion of accidents due to poor lighting are not plentiful. Estimates have varied from 15 to 25 per cent.

Installation of well-planned lighting systems has often been followed by reduced accident rates as well as by increased production. In such cases there is usually an improvement in housekeeping along with other benefits.

If a new system is not possible, present equipment should be surveyed. Much can be done at moderate expense by installing more efficient fixtures. Merely cleaning lamps, reflectors, walls and ceilings will often increase the available light.

Natural Light. Whether to design a plan to make fullest use of natural light or to depend largely or wholly on artificial light, is primarily an economical problem. Safety is concerned more with the quantity and quality of light rather with the source.

Side windows alone are inadequate for lighting extensive areas, even in bright daylight. Sawtooth, monitor or skylight windows take full advantage of natural light but add to the cost of construction and maintenance.

Glare may be subdued by glazing windows with refracting or diffusing glass which will alter the direction of light and improve its distribution, particularly to distant parts of the room.

Translucent coatings for windows on the sunny sides of buildings are also helpful in reducing glare.

Reflection of daylight from sources outside a building can often be utilized. Light colors for faces of structures, walls of courts, and sawtooth roofs are helpful. These surfaces should be kept clean and free from sources of glare.

Sudden transition from bright to dim areas in a plant is hazardous. While the pupil of the eye is adjusting itself to the dimmer light there is a period of semi-blindness. Gradations of light at the approaches to areas of different intensity will avoid this trouble.

Artificial Light. Natural light is not always dependable, especially in winter. Artificial light has been found necessary for 20 to 50 per cent of the total working hours of the "conventional" plant, excluding overtime and night shift operation. For 24-hour operation and for buildings with "controlled conditions," the lighting system is of the utmost importance.

Levels of Illumination. Standards for various types of work will be found in many reference works, including American Recommended Practice of Industrial Lighting and the IES Lighting Handbook.

Illumination levels are determined from readings of a light meter at the spot where the light is needed. The eye is not a reliable gauge.

For general overhead lighting, levels range from 5 foot-candles for storage areas to 50 foot-candles where work is more exacting.

For many precision operations general lighting does not supply enough light at the point of operation. Supplementary lighting may be employed to provide 100 foot-candles for exacting and prolonged seeing tasks such as fine bench and machine work.

For extra fine inspection and assembly work, as in making jewelry and precision instruments, 200 foot-candles are recommended.

Modern Light Sources

The three common sources of artificial light are incandescent, or filament lamps, fluorescent lamps, and high intensity mercury vapor lamps.

Incandescent Lamps. These remain an important and versatile light source. They require only a standard socket and the available current to provide light. Advantages are low cost, simplicity, and convenience, together with a pleasing quality of light.

Incandescent lamps up to 1500 watts are available in a variety of types, with several types and sizes of bases. For general service the medium and mogul screw bases are most commonly used.

Fluorescent Lamps. Since its introduction 1939, fluorescent lighting has been used in an increasing number of industrial and commercial installations.

Advantages are high lumen per watt efficiency and relatively low heat output—about one-fourth that radiated from filament lamps. This characteristic is particularly important in air-conditioned interiors.

Fluorescent tubes are best suited for large areas and they should be mounted high.

The tubes are made in various colors for decorative effects and for color discrimination purposes.

Many improvements have been made in fixtures and research for still better equipment is continuing. Although fluorescent tubes have comparatively low surface brightness, bare tubes are too bright for eye comfort. Reflectors with louvered bottoms or translucent panels are among the types of fixtures used to improve diffusion and reduce glare.

A fluorescent lamp has a longer rated life than an incandescent lamp.

Mercury-Vapor Discharge Lamps. These lamps have high light output

—*To page 29*

Color at Work

Light is salvaged by paint in this machine shop. Light walls and ceilings and a stippled floor, together with functional use of color on machines, improve seeing conditions for the operators. (Du Pont).

MAINTENANCE of plant and equipment involves the use of large quantities of paint for protection against rust and decay as well as for appearance.

Many modern plants owe their attractive appearance to liberal use of white and light tints for interiors. Improved lighting is the most noticeable result and brighter surroundings have important values in improved housekeeping, better morale, decreased fatigue and increased production. These benefits more than offset increased cost of maintenance.

The effect of color on accident rates is not easy to prove, but some companies attribute a substantial share of the credit for improved experience to its scientific application.

Functional Use. Color scheme for machines as well as for walls and ceilings have been developed by paint manufacturers and introduced under descriptive names. Scientifically planned combinations of color and light have proved their value in improved seeing conditions.

To make it easier to see the work and to avoid injury, paint is used to spotlight the point of operation. This is done by painting the body of the machine in one color and the working areas in a contrasting hue.

Before choosing colors for interiors, thought must be given to the artificial lighting, especially if a mercury vapor system is used. These rays make startling changes in the values of colors; only black and white are unchanged.

Color, like music, can be an emotional stimulant or a depressant. It can make people feel warm or cool, cheerful or depressed and the characteristics of various colors must be considered in planning the decorative scheme.

Glare is minimized by removing dark backgrounds which contrast too strongly with the bright areas of windows or artificial light sources.

Color for Identification

The "American War Standard Safety Code for Marking Physical Hazards and the Identification of Certain Equipment" (Z53.1-1945) has been generally adopted throughout industry. It is a codification of certain widely recognized concepts regarding the use of color for safety purposes.

Red is indicated for (1) Identification of fire protection equipment and apparatus, (2) Danger, (3) STOP signs.

Yellow is indicated for caution, and for marking physical hazards; such as striking against, stumbling, falling, tripping, etc.

Green is indicated for safety and for location of first aid equipment.

White and **Black** are used for housekeeping and traffic marking.

Suggested applications for these colors such as the markings of safety cans, fire sirens, posts, handrails, unguarded edges of platforms, location of gas masks, etc., are listed in the Code.

Some variations of the above list are shown in a color scheme selection worked out by Faber Birren in 1943 and published by Du Pont in 1944. In this scheme, red is reserved exclusively for fire protection.

Orange is used to mark the dangerous parts of forming devices, exposed rails and wires.

Blue (as in railroading) is used to mark equipment shut down for repair. It is specified for switch boxes and controls to assure caution.

The vital colors—yellow, orange and blue—have been found to be distinguishable by the average color blind person.

The use of color markings is not a substitute for adequate guards or other safety measures, but a supplement to them. The standards state that "marking of a physical hazard by a standard color warning should never be accepted as a substitute for the complete elimination of a hazard wherever this is possible."

Types of Paint

Paints, enamels and lacquers provide a medium for the practical application of color. Each of these finishes consists primarily of a pigment, a liquid vehicle, a drier and a volatile thinner. Industrial finishes are often subject to severe exposures and many types of specialized paints have been developed for these needs.

Floor Coatings. Research has brought many improvements in industrial floor coatings and coverings. Synthetic enamels and rubber base floor coatings give better service on concrete than ordinary floor enamels and are more resistant to moisture, acids and alkalies.

Light-colored floors conserve light. They may be stippled with darker colors to avoid glaring contrasts.

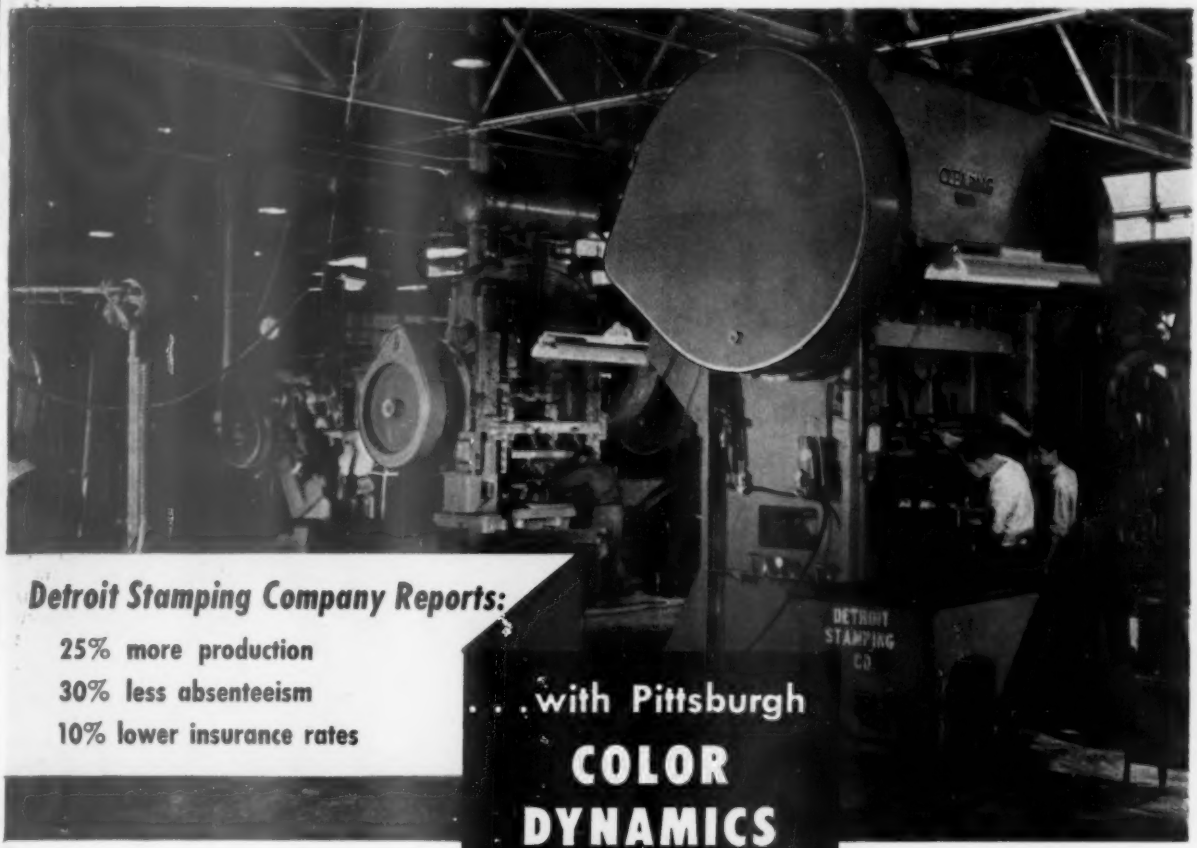
Water Thinned Paints. Cold water paints (casein and synthetic resin types) are lower in price than oil paints and satisfactory for some industrial interiors. They can be applied with spray-coating equipment. They are washable to some degree but where repeated washing is necessary, some other type of paint should be used.

Luminous Paint. Luminous paint is made in both fluorescent and phosphorescent varieties. Used during the war for markings in blackout installations, it offers numerous possibilities as a safety measure where lighting failures and other emergency situations might create hazards.

Traffic Marking. White is preferred for inside traffic markers. It has been accepted for highway traffic and many paint manufacturers produce a paint known as "traffic marker white." White stands out better than yellow in dim light.

Wood Preservatives. When wood is in contact with the ground or with masonry, preservatives prolong its life. For power and telephone line poles creosote is widely used. Where the surface must be painted, NSP (non swelling and paintable) preservatives are available. These consist of toxic chemicals in a non-aqueous solution.

Rust Prevention. When rust has started on metal surfaces, ordinary paint is of little use since corrosion will continue under the paint film. Some manufacturers have developed rust-sealing coatings, both clear and pigmented.



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Higher efficiency, better morale and greater safety are traced directly to use of modern scientific painting system

DETROIT Stamping Company is another example of how Pittsburgh COLOR DYNAMICS, applied in accord with good planning, can pay off — in greater production efficiency, better morale and improved safety.

● **Three years ago** this manufacturer of metal stampings and assemblies for motor cars and household appliances decided to apply COLOR DYNAMICS. An interior decorating scheme was adopted in accordance with the principles of the *energy in color*. An over-all treatment was chosen to give better lighting and, at the same time, produce a visible effect of order, cleanliness and efficiency. Functional colors were used on machines to make jobs easier to see and reduce accidents.

The benefits that have resulted to management and labor alike from Pittsburgh COLOR DYNAMICS are best expressed by Harry C. Robeson, Plant Manager.

● **"Since we repainted,** according to COLOR DYNAMICS, the volume and quality of production have been increased 25 per cent without stepping up manufacturing costs", writes Mr. Robeson.

"Employees can see their work better than ever before. They don't tire as quickly, nor do they get hurt as much. We haven't had a serious accident since repainting. We were awarded special recognition in each of the past two years for our splendid safety record. As a result our insurance rates have been cut more than 10 per cent.

● **"COLOR DYNAMICS has** greatly improved morale, especially among our female employees, whose rest rooms were made more cheerful and pleasant. Absenteeism among all workers has been reduced 30 per cent.

"Our entire staff also takes greater interest and pride in plant cleanliness, simplifying our housekeeping problems."

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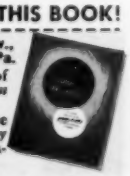

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FOR WORKERS'

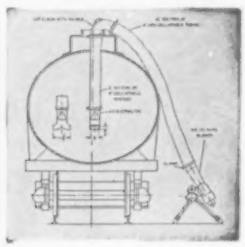
- Safety
- Health
- Comfort
- Efficiency

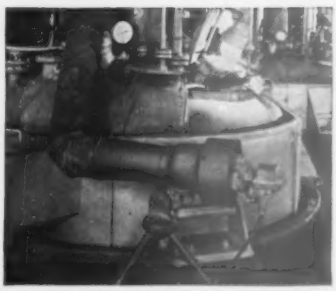
VANO Design "A" VENTILATOR

Vano Design "A" cooling interior of furnace, supplying fresh air through 10 feet of "Ventube" to provide safety and comfort during repair work.

Vano Design "A" delivering fresh air to cable manhole, expelling sewer gas, making entrance safe in a few minutes.

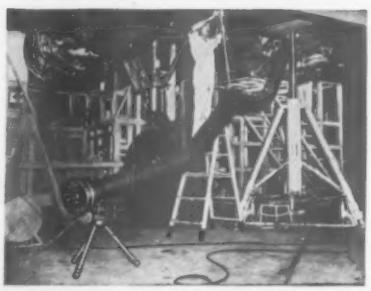
Vano Design "A" Ventilator plus a few accessories feeds large air volume into tank car, driving out fumes, stagnant or hot air for workers' safety and comfort.





Vano Design "A" supplying fresh air in Reactor Room of Synthetic Rubber Plant.

Vano Design "A" Ventilator supplying fresh air to men working in wing compartments, fuselages, etc.



Powered by a ½ hp motor, and equipped with the exclusive Coppus axial-flow propeller-type fan, this general-purpose blower delivers 1500 CFM of fresh air. It supplies ventilation for tanks, tank cars, drums, vats, underground cable manholes, pipe galleries, airplane wing compartments and fuselages, and other confined places. Weighs only 103 lbs. Uses 8"-diameter flexible canvas tubing ("Ventube").

VANO DESIGN "C"

VENTILATOR-EXHAUSTER

Vano Design "C" equipped with 8" discharge tubing removing welding fumes.

Vano Design "C" equipped with two suction lines removing welding fumes for operators' safety.

For withdrawing welding fumes from confined places or directly from the welding rod ...or for expelling fumes or hot air from enclosed vessels. You can get it with 8" suction inlet for 8" non-collapsible tubing ...or with multiple inlet nozzles for 5", 4" or 3" suction hose. The discharge outlet takes 8" "Ventube". Powered by a ½ hp motor, it weighs only 85 lbs.

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Please send information on the Blowers that clear the air for Action.

- ☐ in tanks, tank cars, drums, etc.
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- ☐ exhausting welding fumes.
- ☐ stirring up stagnant air wherever men are working or material is drying.

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(Write here any special ventilating problem you may have.)

COPPUS "BLUE RIBBON" PRODUCTS—*Designed for Your Industry, Engineered for You*

Housekeeping Aids

HOUSEKEEPING as it applies to industry goes far beyond the clean-up and paint-up program. Its far-reaching activities are vital to productive efficiency, sanitation and health, accident prevention, fire prevention and employee morale.

Maintaining order and cleanliness is a joint responsibility of management, supervision and employees. It is more than janitor work. It is facilitated by careful planning of buildings and methods.

A well-designed and well-built plant is easier to keep clean and free from hazards. These are some of the essentials:

1. Well-defined aisles and ample room to work.
2. Adequate and convenient storage for materials and tools.
3. Efficient methods and equipment for handling material.
4. Ventilation that removes dust and fumes at the source where possible.
5. Floors and walls that require a minimum of maintenance.
6. Ample window space for natural lighting, and adequate well-distributed artificial light. (Windowless plants involve additional problems.)
7. Adequate personal service facilities—clean up-to-date washrooms and lockers and an inviting place where employees may eat lunches.

Organization. Housekeeping has become a science and maintaining orderly and hygienic working conditions requires an adequate crew of able-bodied men. They should be thoroughly trained in their duties and provided with the necessary equipment and supplies.

Equipment

Vacuum cleaners are useful in industry as in the home. Heavy duty types are available in several models with a variety of attachments. In addition to floor cleaning, they remove dust accumulations from corners and from places overhead.

Where dust sources are relatively close together, a piped system is often practical. Cleaning implements are attached to inlets located at frequent intervals. Some hotels, office buildings and factories use this type of dust removal.

For most industrial uses, portable vacuum cleaners are more suitable. In most factories the dust sources are widely scattered and the more flexible types of portable equipment meet all requirements at lower cost.

Floor machines of several types handle the heavier jobs of floor cleaning. With them floors can be scrubbed or dry-cleaned and waxed and polished.

Crusts of dirt, oil and metal cuttings can be removed with a wire brush much more quickly and easily than it can be done by hand spudding.

For finer finishing, steel wool rolls are used. Dry-cleaning models have a vacuum pick-up for collecting dust.

Scrubbing, rinsing and drying can all be done by machine with a minimum of interruption to production.

The only effort required by the operator is pushing the machine across the floor.

Painted floor lines to mark aisle boundaries are invaluable in maintaining order and safety.

HOUSEKEEPING ESSENTIALS

- Vacuum cleaner—heavy duty
- Floor machine
- Brooms
- Hand brushes
- Pails
- Mops
- Cheesecloth
- Rubber gloves
- Bowl and urinal swabs
- Detergents
- Oil absorbents
- Disinfectants and deodorants
- Metal containers for cleaning rags

Power sweepers are time and labor savers where large areas must be swept and the litter is relatively light. Some models are also used for sweeping up leaves from the plant grounds.

Brooms, brushes, mops, etc., are needed in both large and small plants to supplement the mechanized equipment. Tools of good quality are more durable and efficient and they encourage better work.

Aisle marking machines. Wide, clear aisles are signs of a well-kept plant. White lines are constant reminders to keep them free from obstruction and to pile stock within designated areas. The lines can be renewed quickly, neatly and economically with an aisle-marking machine.

White, which has been adopted for highway traffic lines, is preferred for floor marking within the plant.

Trash containers at convenient locations throughout the plant help to keep litter off the floor. Containers with self-closing lids are best, particularly where oily rags and waste are stored. Containers may be painted a distinctive color to call attention to their presence.

Steam-cleaning units, which deliver jets of steam under pressure are used for cleaning many types of processing and fabricating equipment and removing stubborn deposits of dirt from floors, walls and ceilings.

These units are available in both stationary and portable models.

Smoking areas are being provided in an increasing number of plants. Receptacles for cigaret butts and pipe ashes, which will not tip and spill their contents should be provided.

Supplies

Progress in the development of supplies for the janitor force has been no less notable than in mechanized cleaning equipment. No longer is it necessary to depend on yellow soap, strong alkaline powder and odorous disinfectants in the war against dirt. Much research has gone into the development of safe, effec-

tive cleaners, and manufacturers can furnish helpful data.

Cleaners. Basically, it is water that does the cleaning. But water by itself is not always effective. It needs the aid of soap or one of the newer synthetic detergents.

There are three types of dirt: (1) Water soluble matter; (2) Oils and greases; (3) Inert solids. A general purpose cleaner must dissolve, emulsify or suspend these types of dirt. It must not form a curd when used with hard water.

Modern cleaning compounds owe much of their effectiveness to the addition of wetting agents and water softeners.

Care of floors. Hardwood floors have long life if properly cared for. Sealing prolongs their life.

An unfinished floor dries out quickly and begins to crack and splinter. Scrubbing opens the pores of the wood and excess water damages it. Several kinds of wood seals are available, differing in their penetrating effect.

Wax is used both to improve the appearance of the floor and to protect the surface. It makes daily maintenance easier by keeping the dirt on the surface where it is easier to remove.

Self-polishing water wax can be used with safety on all types of floors commonly used in industry. Buffing waxes contain a hydrocarbon solvent which will injure asphalt tile, mastic or rubber. Self-polishing waxes are considerably less slippery than buffing waxes. Tests have been made to

PLANT HOUSEKEEPING

Check Card—General Conditions

Keep it clean and keep it orderly. CHECK:

FLOORS AND STAIRS	☐ Dropped objects picked up ☐ Scrap pieces in box ☐ Oil, grease spills wiped up ☐ Stock material out of way
PILES	☐ Good foundation—straight sides ☐ Layers cross-tied ☐ Break-down from top
AISLES	☐ Trucks ☐ Hose and electric cord } not in aisles ☐ Ladders, boxes, etc.
LOCKER AND WASHROOM	☐ Oily clothes and rubbish out of locker ☐ Floor dry and clean ☐ Newspapers, lunch scrap in waste can
FIRE	☐ Flammable waste in covered can ☐ Fire equipment not blocked

(See other side)

SAFETY INSTRUCTION CARD No. 29
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check these advantages of

HOFFMAN
VACUUM CLEANING SYSTEMS

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For your safety campaign against dust hazards, Hoffman vacuum cleaning equipment is built for continuous heavy duty service. Sturdy construction and efficient design assure fast, thorough cleaning at low cost.

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Higher vacuum and greater dust capacity in Hoffman equipment. You can do more cleaning for longer periods. Exclusive features for disposal of collected dust speed up cleaning operations.

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With normal lubrication, hundreds of plants have established amazing maintenance-free records with Hoffman equipment. No internal mechanical wearing parts in the Hoffman exhauster. Bearing design is outboard mounted for quick, easy change.

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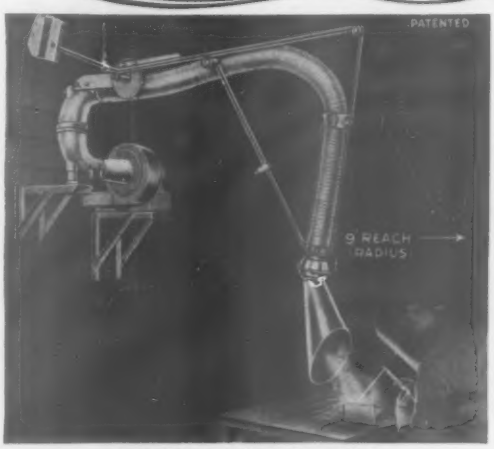
"It certainly is a relief to have fumes and heat removed while I'm welding. The Ruemelin Collector has great suction. It makes a day's work pleasanter!"



Ruemelin Fume Collector in operation.

Welding shops equipped with Ruemelin Fume Collectors are assured of a clean shop atmosphere. Noxious fumes, heat and smoke are eliminated at their source, thus improving working conditions, lessening fatigue and paving the way for increased plant production.

The Ruemelin Fume Collector hood can be instantly placed where needed anywhere in the booth welding area. No tedious adjustments necessary. Just pull the inlet hood to the welding position and you are ready to go. Approved by state industrial commissions and by compensation insurance companies. Simple to install. Thousands in service. Many users send in repeat orders. Write for bulletin 37-D today.

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determine the coefficient of friction of various floor finishes on different types of floors. However, it has not been found possible to give any finish a rating which would apply for all surfaces and all conditions.

For floor scrubbing the cleaner should do the work without leaving a slippery film. Soap is permissible for such surfaces as concrete, common brick, wood block and mastic. For marble and smooth tile a cleaning powder that does not leave a slippery residue should be used.

Strong alkaline cleansers and abrasives should not be used on linoleum.

Oil absorbents. Around machines and other places where oil and grease accumulate, hazardous and unsightly conditions develop. Oil spills should be swept up promptly, and the use of a non-combustible absorbent compound makes it easier to keep floors clean.

Absorbents are available in two types—one for oils and grease; the other an all-purpose absorbent where water and other liquids are present. They are much more satisfactory than sawdust, waste or rags.

Tests by Underwriters' Laboratories have rated the effectiveness of these compounds in absorbing oil and grease and from the standpoint of fire safety. They are not subject to spontaneous heating unless the absorbed oil has that quality.

Oil-soaked garments, shoes, ropes and belts can be dry cleaned by burying in the compound.

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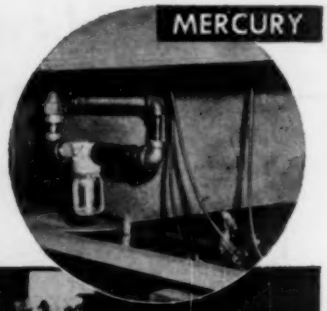

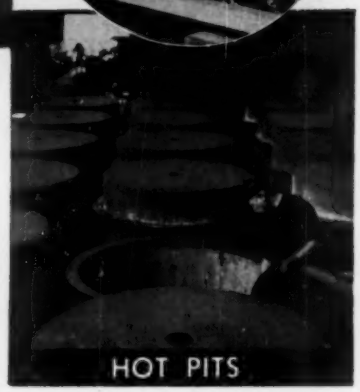

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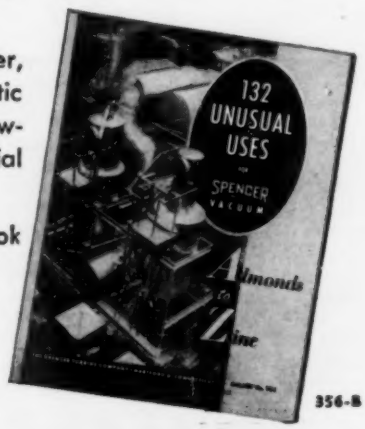
Spencer Vacuum is not new to industry, but more than 100 unusual applications in industry have been used for the first time during the past few years.

This impetus came with the surge of war production, requiring that everything be done well and quickly, and that the heretofore impossible be done immediately.

No man can work in a hot pit, pick up globules of mercury with a spoon, or chase carbon monoxide gas out of a garage with a fan. Yet Spencer Vacuum does all three jobs almost automatically.

Spencer provides the vacuum power, the special hose and tools, automatic dumping mechanisms, and the know-how based on hundreds of special applications.

All you have to do is send for the book of "132 Unusual Uses" and use your ingenuity and imagination to discover a highly valuable application for your plant.



356-B

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A Dust-Free Plant IS ALWAYS MORE EFFICIENT

Consult DRACCO ENGINEERS about DUST and FUME CONTROL

DRACCO CORPORATION
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Plant Walkways —Floors, Stairs and Ramps

Concrete is the most widely used type of industrial flooring. It can be finished in varying degrees of smoothness or can be used as base for other types of flooring.

FLOORS are subjected to more wear than any other part of the factory structure. They provide support for foot traffic and rolling wheels. They also catch everything that falls, whether it is a heavy object that damages the surface or a liquid that makes it slippery.

For these reasons the flooring material should be selected according to the needs of the industry. Whatever the type of floor, it should receive daily maintenance in the interests of cleanliness and sanitation. Breaks should be repaired promptly to avoid a major overhaul as well as tripping hazards.

General Requirements. Various operations make special demands on the floor but the following specifications, or a reasonable compromise, are desirable for most industrial purposes:

1. Strength—Sufficient to carry up to four times the expected static load or six times the moving load.
2. Resistance to slipping—Material should not be slippery nor likely to become slippery through wear or contact with other materials.
3. Durability—It must stand up under normal traffic and wear reasonably even without developing holes and splinters.
4. Maintenance—It should be easy and economical to keep sanitary and in repair.
5. Fire resistant — Always desirable; essential in many types of buildings.
6. Comfort—Resilience under foot and low heat conductivity reduce fatigue.
7. Quietness—There is growing recognition of the importance of this feature. Noisiness may offset other advantages.
8. Initial cost must be comparable with other materials.

Materials

The perfect flooring material has not yet been discovered. Many materials are excellent for certain uses but each has its limitations. Some with a high rating for durability and resistance to slipping may be too high in installation cost for large areas but practicable where a sure footing or resistance to chemicals or abrasive is essential.

Concrete. Properly prepared and placed, concrete is suitable for a wide variety of industrial uses. It is one of the best materials for damp locations. The surface should be properly graded to avoid low spots where liquids could collect.

For some processes, floor drains with screen strainers should be installed at strategic spots.

The mix should not be skimped. The water-cement ratio should be as low as possible. Machine finishing helps in getting a dense concrete.

Often it is trowelled too smooth with a steel trowel. Finishing with a wood float and then going over it lightly with a carborundum stone, if desired, will produce a surface that will not be too slippery. Some persons believe that a very smooth surface is more tiring to the feet than a relatively rough one.

Concrete should be cured properly and for a long enough period. When the floor has set, and before it is used, hardening compounds can be applied to prevent dusting .

Concrete floors can be made conductive and non-sparking with surfacing compounds containing nonferrous metallic aggregate. This prevents both static sparks and sparks from contact with metallic objects. This treatment also makes the floor more wear resistant.

For repairing holes and cracks there are several types of compounds which are superior to concrete. Patching with concrete, even when well done, may crack out under heavy loads.

If a painted surface is desired, the concrete, if new, should first be treated with zinc sulphate solution to neutralize alkalinity. A general purpose floor enamel can be used but finishes prepared especially for concrete are more durable.

Asphalt is non-dusting, elastic, odorless, and easily repaired. It is resistant to weather and moisture but is affected by oils. solvents, acids and alkalis. It stands up well under traffic but ordinary commercial grades of asphalt soften at temperatures above 95 degrees F.

There is a hard grade of asphalt which remains firm up to 158 degrees F. There are also acid-resisting grades.

Asphalt emulsion, sold under various trade names, is made into a mortar with sand and cement and laid cold about one-half inch thick. On a substantial wood base it will carry moderate traffic; with a concrete base it will stand heavy trucking. The surface is somewhat harder than the hot mastic type. It is also affected by oils and solvents.

Plastic flooring materials of several types are available. They are generally resistant to oils and chemicals but the manufacturer should be consulted about the exposure. These materials are higher in price and used principally for patching and resurfacing limited areas.

Terrazzo and **Magnesite** are decorative materials used frequently for halls, washrooms, etc., in public buildings. On a rigid base they will stand moderate loading and traffic.

Ceramic tile offers considerable resistance to abrasion, chemicals and staining. It is used in many food products plants where floors must be washed frequently.

Linoleum is quiet, dustless, easily cleaned, and a poor conductor of heat. It is used for offices, laboratories and workrooms which must be kept particularly clean. Since it may become slippery when polished the type of finish is particularly important.

Asphalt tile is also suitable for offices and stores. It is moisture resistant but susceptible to indentation and oil. It is non-slippery in its

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Ladders

MANY industrial operations, particularly maintenance work, involve getting from one level to another. Stairways, ramps or fixed ladders are desirable when frequent access to a higher location is necessary. For occasional use portable ladders are needed.

Accidents involving ladders may be due to unsafe practices by the user, selecting a ladder too light for the work, and neglect or abuse.

In selecting ladders for industrial use, the American Standard Safety Code for Wood Ladders (A14.1-1948) is a reliable guide. Ladders conforming to code specifications are plainly marked.

Metal ladders are not yet covered by any code, but ladders marketed by reliable manufacturers meet exacting tests. The American Metal Ladder Manufacturers Association, organized in April, 1949, is engaged in developing standards.

Definitions (ASA)

The following types of ladders are commonly used in industry:

1. Fixed ladder—One fastened to a structure in a permanent position.

2. Portable ladder—One which may be used at various locations, such as single, extension, step, and trestle ladders.

3. Single or straight ladder—One consisting of but one section.

4. Extension ladder—One consisting of two or more sections traveling in guides or brackets so arranged that it may be adjusted to different lengths.

5. Stepladder—One having treads and so constructed as to be self-supporting.

6. Trolley ladder—One running on or in a track, fastened overhead, the plane of the ladder being at right angles to the line of motion.

7. Side-rolling ladder—One riding on a guide rail, generally fastened to shelving, the plane of the ladder being also its line of motion.

8. Sectional ladder—One consisting of two or more sections so constructed that the sections, when combined, will function as a single ladder.

9. "A" or Trestle ladder—One consisting of two single ladders hinged at the top to form equal angles with the base.

10. Extension trestle ladder—One consisting of an "A" ladder with an additional single ladder which is adjustable vertically and provided with a lock to keep it in place.

Materials and Construction

Ladders must have strength and light weight at reasonable cost, which limits the choice of materials. Certain kinds and grades of wood, listed in the code, meet these requirements.

Ladders may have either spreading or parallel straight lines. They may also have sides flaring at the base to increase stability, and converging at the top for specific uses.

Light Metals. Alloys of aluminum and magnesium are light in weight and resistant to moisture. In case of overload there is deflection warning instead of sudden breakage. Prices are higher than for wooden ladders.

Metal ladders should be examined for sharp edges and burrs on the side rails and for soft metal rivets that might shear off under a load.

All metal ladders are conductors of electricity and should not be used around electrical equipment. Decals or painted warnings against such use should be carried on all ladders.

Single, extension and stepladders and planks, stages and hangers are available in light metals.

Type of Ladders

Single ladders, extension ladders, stepladders and platform ladders are to be found in almost every industrial plant. For more specialized uses there are trestle ladders and telescoping ladders and towers.

Single ladders up to the maximum length of 30 feet specified by the Code are made. Extension ladders are preferred for sizes longer than 24 feet because of transportation and storage difficulties.

The sectional size of side rails must vary with the length of the ladder and the diameter of the rungs must vary with the width of the ladder between the side rails. The diameter of the rungs should not be less than 1⅛ inches and that of the tenon not less than ⅞ inch.

Oilers' ladders should be provided with hooks at the top so the ladder may be securely fastened to overhead shafting.

Extension ladders should be equipped with two automatic locks. In the automatic lock the keeper is forced by a spring to grip properly and to seat under the rung. For metal parts, steel, malleable cast iron, or other equivalent metal specified by the Code should be used.

A rope hoist for raising the top section is one of the essentials of a good extension ladder. Lower guide irons, not found on many light-duty ladders, are required by the Code.

Stepladders are built in lengths from 4 to 20 feet.

For industrial use they should have side rails at least 25/32 inch (preferably one inch) by 3¼ inches, or 2¾ inches for stepladders less than 10 feet long. Treads or steps should not be less than 3¾ inches wide and should be truss-rodded or braced to the side rails with angle braces.

Stepladders should be constructed so that when they are in the open position the front section will have level treads.

Unstable ladders not only invite possible collapse or tipping, but the shaky support they give tends to make workmen nervous and thus more susceptible to accident.

To guard against pinching or bruising hands, the automatic locking device or spreader should have all sharp points removed or covered. The rung-back type permits a helper to assist from the back of the ladder.

Platform or safety ladders offer a solid working platform guarded on three sides. They are of particular advantage on jobs at fixed heights where the work requires considerable freedom for the worker.

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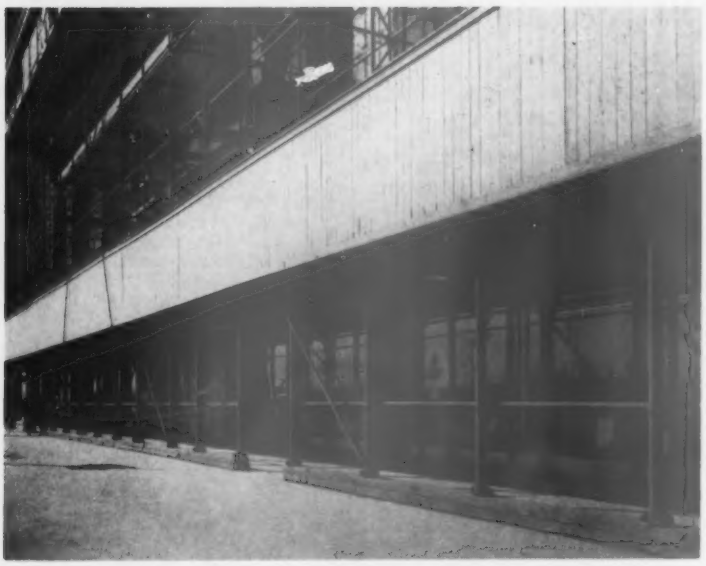
Scaffolds and Staging



Tubular steel scaffolding and sidewalk bridge erected for remodeling work on an office building. (Patent Scaffolding Company).

SCAFFOLDS and staging of various types are used in construction and maintenance work. The two terms are synonymous, the former being used in the construction industry and the latter in shipbuilding.

Accidents involving scaffolds are usually serious because they involve falls of men or materials from high levels. Principal causes include defective materials, improper construction, unsafe practices and physical disabilities of the individual. Men who work at high levels should be carefully selected for the job.

Types of Scaffolds

Many types of scaffolds are in use, including some with specialized uses by certain trades. The principal types are:

1. Tubular steel
2. Swinging
3. Suspended
4. Built-up wood

Tubular steel scaffolding is used on large construction jobs where it will be in use for considerable time and where work is carried on at great heights. This type of scaffolding may be purchased or rented. When rented, the contract usually includes erection and dismantling.

Steel scaffolds have low wind resistance, are fireproof, and dismantling is less hazardous than tearing down wood scaffolding. Because of interchangeable parts they can be erected and dismantled quickly.

Tubular steel scaffolds for use inside buildings are frequently mounted on casters. When casters are included, the base section should be made rigid by additional bracing to tie the bottoms of the upright tightly together. Caster locks should be provided to prevent movement while in use.

All steel members should be rustproofed by cleaning and repainting after each job.

Portable Scaffolds. Maintenance work in industrial plants and in public buildings is made quicker and safer by portable metal work stands and towers. They provide a broader platform than the platform ladder, permitting more than one man to work and providing more space for tools.

Some types of portable towers are telescoping while others have fixed heights. In addition to the models with four casters, there are work stands of the wheelbarrow type easily moved by one man.

Swinging Scaffolds are useful for painting, tuck-pointing, window glazing and washing, and other operations where the scaffold height must be adjusted frequently as the work progresses.

A swinging scaffold should be securely hung from eaves, cornices, or other reliable support, with hooks of adequate strength. Anchorage should be carefully inspected before the hooks are placed.

Ropes should be of the best grade manila not less than ¾ inch, on at least six-inch blocks. Steel cable should be not less than 5/16 inch. Steel cable is wound on a drum, not pulled by hand.

Suspended scaffolds are supported by outrigger I-beams attached to the frame of the building. They are recommended for use on buildings more than five stories high which have a frame to provide the overhead support. The scaffold is raised and lowered by steel cable operated by winches.

The shackles or beam clamps holding the cables should be securely fastened to the outriggers with a stop bolt in the outer end of each outrigger. The cables should be securely fastened to the outriggers and to the putlogs which carry the platform or to the hoisting machines.

Built-up Scaffolds. Wooden scaffolds are temporary structures and workmanship and materials are often substandard. Attempted economies frequently result in scaffold failures accompanied by serious injuries if not by fatalities.

Lumber for scaffolding should be inspected on delivery and stored where it will be protected from weather.

Lumber grades. Specifying a particular grade of lumber may not be practicable since no one grade will be available in all localities. Names also have different meanings in different sections.

Spruce, fir, longleaf yellow pine, Oregon pine; or wood of equal strength should be used. Material should be straight grained, free from knots, checks, cracks, decay or other defects.

Not all species of wood, nor all grades of a single species, are suitable for scaffold planking. Only the strongest species and grades should be used. In general, the heavier and denser woods are strongest.

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SWINGING SCAFFOLDS

WHEN working from swinging scaffolds, observe every precaution, including the following:

1. Never overload a scaffold.
2. Use nothing but secure knots and hitches, and make sure that ropes are securely attached.
3. Always tie the fall lines to the scaffold, itself; never to any part of the building.
4. When using acid or caustic solutions, take every precaution to keep them from getting on scaffold ropes.
5. Jumping onto or from a scaffold is dangerous; do not climb or slide down the suspension ropes.
6. Remove all loose objects from the scaffold when stopping work for meals or when leaving for the day.
7. Be sure to lash the scaffold to some permanent support so that in case of sudden storm it will not swing violently.
8. No work should be done on swinging scaffolds during stormy weather.
9. Spread a canvas drop on the under side of a scaffold when painting or when the area below is used as a passage-way.

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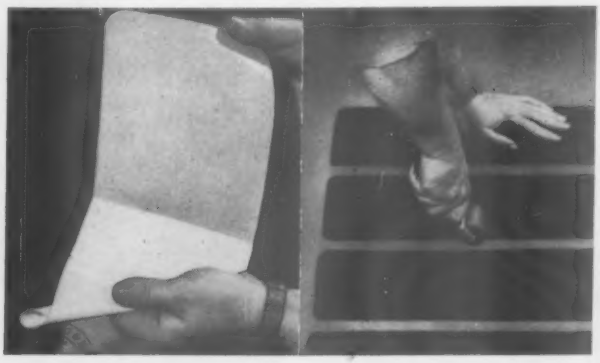

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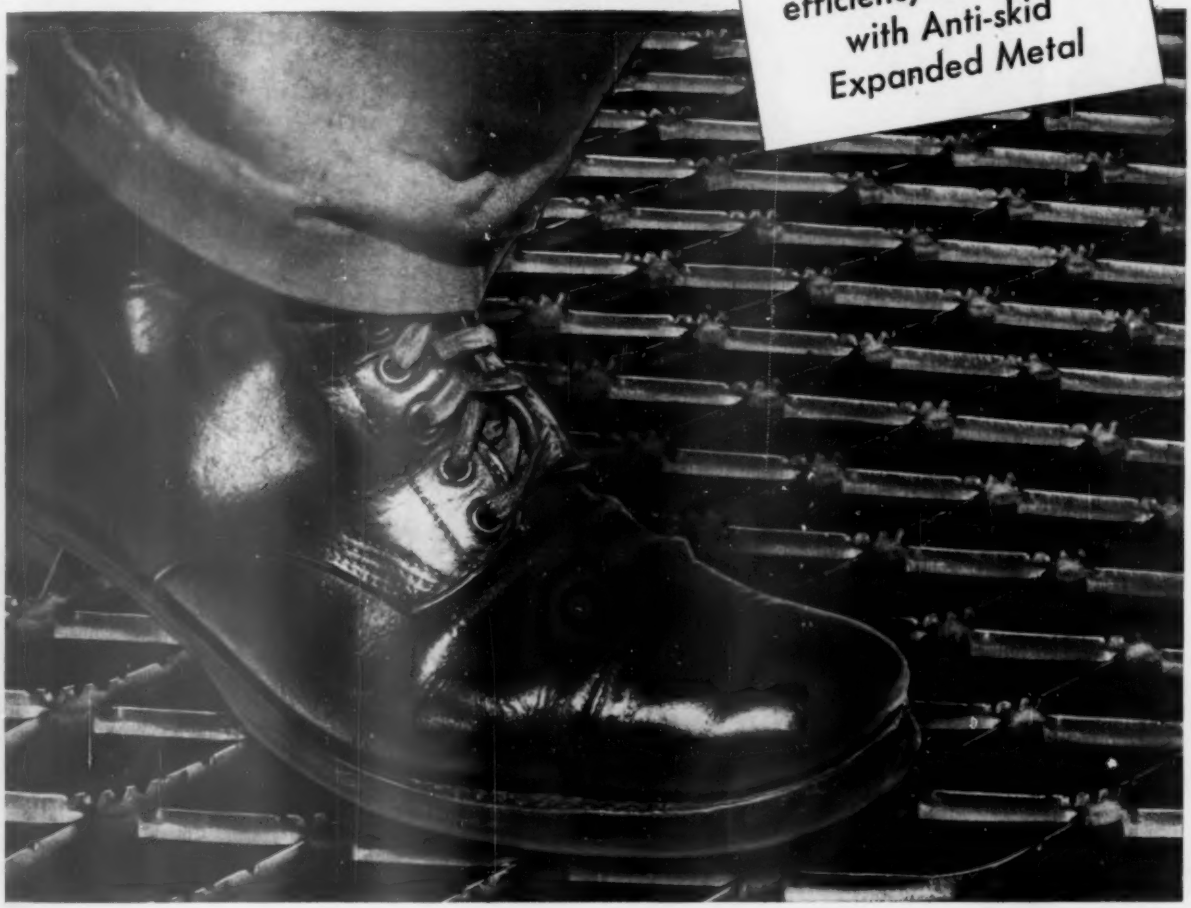
It pays to guard efficiency and safety with Anti-skid Expanded Metal



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In addition, Blaw-Knox Steel Grating is *electroforged* into one piece for extra strength and load bearing durability.

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Light

(From page 15)

per watt, low operating cost and long life. They require auxiliary equipment, which makes the initial cost higher, and have a relatively long restarting time. These characteristics and the less pleasing color of light have limited their use.

Mercury vapor lamps are used frequently for high bay mountings where areas are large. Where rough work is done, as in steel mills, they may be used alone. Where color discrimination is important, alternate fixtures of mercury and incandescent lamps are used.

Several types of mercury-vapor lamps are available. The pressure at which the lamp operates accounts in a large measure for the color of the light produced.

Glow Lamps. These lamps are used as signal, pilot or night lights. They are not practical for general illumination.

Reflectors. No lamp should be used without a suitable reflector. There are several factors to be considered in choosing the types of units:

1. Desirable distribution of light and suitability for the interior involved.
2. Sturdiness of construction.
3. Efficiency of light output.
4. Adaptability in case more light is desired.
5. Economy of cleaning and replacement.

Special Lamps and Fixtures

Where lighting equipment is subject to abnormal conditions of service. special types are available.

Vibration-resisting lamps give greater service where ordinary lamps would have a short life because of excessive vibration.

Weather-resistant lamps are used for outdoor lighting in industrial plants, docks, athletic arenas, etc. They stand exposure to rain, sleet and snow without cracking.

Explosion-resistant fixtures are used where dusts, gases, fumes and vapors may create a hazardous atmosphere.

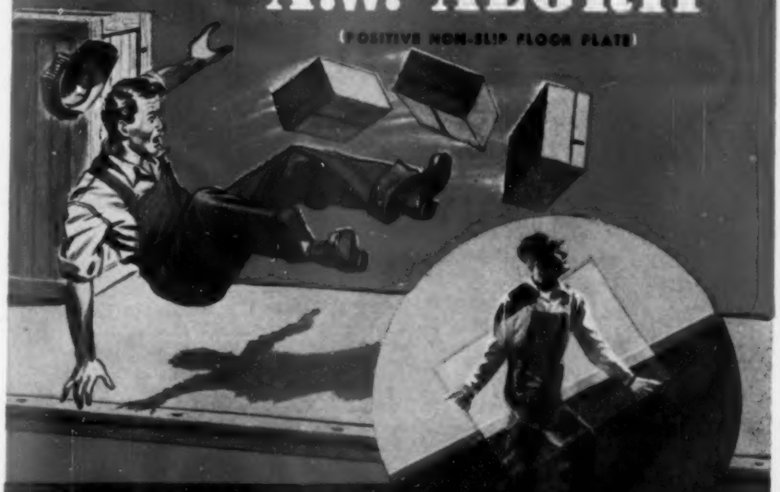
Infrared lamps, now available in types and sizes up to 1000 watts, are being used increasingly for baking, drying and heating processes, as well as for therapeutic use.

Where changes in lighting requirements vary from time to time, lighting fixtures are mounted on overhead trolleys. Fixtures can be moved to other parts of the plant or rolled to any location along the line. Such systems can be adapted to either incandescent or fluorescent fixtures.

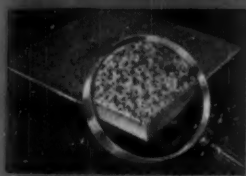
—To page 30

NOW! END SLIPPING ACCIDENTS WITH A.W. ALGRIP

(POSITIVE NON-SLIP FLOOR PLATE)



Non-slip—Even on Steep Inclines



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Install A.W. ALGRIP for positive non-slip protection in all areas subjected to oil, grease or water on which men walk or climb . . . loading platforms, ramps, washroom floors, fire escapes, running boards and similar surfaces. A.W. ALGRIP prevents slipping even on steep inclines. And remember it's low in cost, easy to install, requires no maintenance, and is resistant to heat, fire and heavy traffic.

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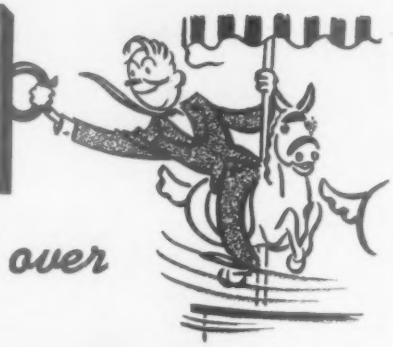

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Maintenance. Efficient lighting requires a systematic program of maintenance. Equipment may meet all requirements when installed but dust and grime immediately start reducing light output.

The recommended method of establishing a maintenance schedule is to check the illumination periodically with a light meter. When illumination has decreased to 75 per cent of its original value, the lighting equipment should be washed with warm water and a detergent containing no free alkali.

Group replacement of lamps, both incandescent and fluorescent, is often practicable and desirable. It is based on the assumption that the saving in cost of replacing a large number of lamps at one time is greater than the value of the remaining light output in the lamps. The point of replacement is usually 60 to 80 per cent of the rated lamp life.

Disconnecting hangers permit lowering fixtures to the ground or floor for cleaning, relamping and repairs. Much climbing is eliminated.

Emergency Lighting. In plants where failure of the power system might endanger life, an emergency lighting system is desirable. In some states it is required under certain conditions.

For outdoor use it is often desirable to have searchlights, stationary or portable, which can be concentrated on critical areas when needed.

Another type is a portable system which can be moved to the scene of a fire or accident.

Ventilation

(From page 14)

re-entering the plant or endangering the public.

Common types of arresters are:

1. **Cyclone collectors** (inertia type) separate solids from air by change in air velocity. Air from the main duct of the exhaust system, under high velocity, enters the large chamber of the cyclone, where the air is given a circular motion. The heavier particles are thrown to the outer wall of the cyclone by centrifugal force and fall along the wall while the air escapes through the top.

Cyclone separators are often used in series in an exhaust system ahead of cloth-type collectors to reduce the abrasive action on the cloth. They are relatively inefficient in removing small particles from the air.

2. **Cloth-type arresters** use screens or tubes of special cloth having sufficient area to separate the solids from the exhaust stream. The accumulating dust pack increases resistance to the air flow, and as this resistance reaches a pre-dominated value, the

cloth surfaces must be agitated by hand or machine, allowing the accumulated dust to fall into a hopper.

Cleaning should be done with the air flow shut off. Dust in the hopper should be removed periodically.

3 **Wet collectors or air washers** use several devices for obtaining contact of water with the air of the exhaust system so that dust particles form a sludge. It is customary to pass the air through a labyrinth over which water is sprayed or atomized.

4. **Electrostatic Precipitators** are used where exacting standards of cleanliness are demanded by the nature of the product, or where valuable dusts are reclaimed. Dust particles move through a powerful electrical field, picking up a charge which causes them to be attracted to the collecting electrodes.

Testing Instruments. A number of instruments may be used for testing the air flow in exhaust systems, such as the vane anemometer, the Kata thermometer, the pitot tube, and patented direct-reading devices. The only real check on efficiency is a measurement of the amount of contaminant in the air around its point of origin.

Unless every phase of the control program is checked periodically, hazardous conditions may creep in.

Multiple Tenant Buildings

Housing an industrial plant in a multiple tenant building frequently involves special problems. The company must consider not only its own personnel but also fellow tenants and the building management. Multiple tenant buildings are frequently located in built-up sections where there may be restrictions on some types of operation as well as traffic and parking problems.

The following factors should be considered:

1. Zoning ordinances and their effect on the type of industry.
2. Approval of buildings and facilities by local and state authorities.
3. Floor load capacity.
4. Ventilation and exhaust—particularly of substances that may affect neighboring industries or create a public nuisance.
5. Public transportation and parking facilities.
6. Plant protection—proximity to hazardous operations, type of building construction, fire alarm and emergency lighting equipment, fire fighting apparatus, watchman service, exits, etc.
7. Electric wiring — adequacy and safety for light and power requirements.
8. Elevators—location and provision for operation and maintenance.
9. Personal service facilities.
10. Possibilities for expansion.

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in your plant and on your products

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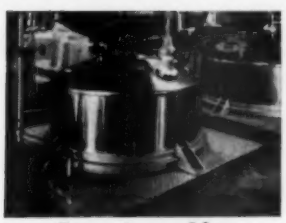
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SHOWER ROOMS

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... plus many other applications.

SURE-FOOT remains non-slip wet or dry... helps prevent costly lost-time accidents!

Paint those slippery danger areas in your plant or building now with FROST'S SURE-FOOT Non-Slip Abrasive Paint. This new paint cuts losses due to slips and falls when applied to steps and stairs, aisles, inclines, loading platforms, and many other danger spots.

SURE-FOOT Non-Slip Abrasive Paint is amazingly economical—costs just a few cents a square foot—and pays off in fewer injuries and improved working conditions. SURE-FOOT'S special formula assures long dependable service under heavy foot traffic and light-wheeled vehicles.

FROST'S SURE-FOOT PAINT comes in four modern functional colors in non-glare finishes—gray, red, black, and green. Water, oil, grease, or other liquids cannot penetrate this protective paint. Fire-retardant, too!

ADAPTABILITY—SURE-FOOT is easily applied to any size area. It adheres equally well to steel, aluminum, wood or concrete surfaces.

RE-PAINTING—Carbide crystals provide the non-slip element in FROST'S SURE-FOOT PAINT. Easily re-newed where heavy traffic eventually wears through—just re-paint—no stripping or removing of old paint.

EASY TO APPLY

Apply like ordinary paint. Dries over-night to tough, non-slip finish.

ELIMINATE slippery spots in your plant: Write for SURE-FOOT Bulletin 3-1 today!

Frost PAINT AND OIL CORPORATION
MINNEAPOLIS 13, MINNESOTA

Ladders

(From page 23)

Safety ladders are usually built for heavier duty than the ordinary step ladder.

Height to platform ranges to 18 feet, the overall height in each case being 2 feet or more.

Trestle ladders of the "A" type (with a center section which slides up and down) are used in maintenance work. These ladders are commonly used in pairs with a stage between them or in sets of four with two stages and with planks from stage to stage.

Points to be considered in selecting extension trestles are guides of adequate length, strong locks of the sliding section, and a safety spreader.

Telescoping ladders are mounted on rubber tired ball-bearing wheels with floor locks. Maximum height of working platform is 15 feet. When down, it will go through an ordinary door or into an elevator.

Telescoping towers reach still greater heights. These portable units can be extended up to 49 feet. The man on the platform controls the travel through an electric push-button system. Another push-button control is located on the frame below but the man above can lock the platform in place by pressing a safety button. Outriggers give stability.

Chain and rope ladders are designed for emergency use as a means of escape in case of fire or explosion, and for rescue work where rigid ladders cannot be used. These are not a substitue for permanent fire escapes.

Crow's Nest Ladders. For many outdoor maintenance jobs the "Crow's nest" ladder mounted on a truck is used. It is an extension platform ladder, securely mounted on the vehicle, which can be rotated in a com-

—*To page 36*

To Insure Safe Ladders

1. Inspect every ladder as soon as received.
2. Set up a routine for regular and thorough inspection.
3. Keep a record for each ladder. It should include:
   a. Date purchased or built.
   b. Date of inspections.
   c. Condition and needed repairs.
   d. Dates for next inspection and recoating.
4. Record system may be supplemented by stenciling on ladder a date to indicate when next inspection is due.
5. Instruct men to observe precautions and to report any defects before using ladders.

SAFETY...

SPREAD IT ON WITH A TROWEL!

Get this New, Free Folder and Applied Sample that shows the quick, safe way to solve the problem of slippery floor surfaces

Danger is expensive. And probably one of the most common hazards in industrial operation is slippery floor surfaces.

Cut the cost of that danger with Flintdek* . . . Flintkote's anti-slip floor coating *now available in colors.* This serviceable safety coating is a cohesive resinous plastic that contains wear-resistant, anti-slip aggregates. It is especially designed to resist oil, gasoline, alcohol, dilute acids, cleaning fluids and other damaging agents as normally encountered in industrial plants.

You can apply Flintdek quickly and easily by trowel to almost any clean, rigid surface. Use it around machinery, on pedals, steps and ladder treads, ramps and platforms, floors and decks, around pools and tanks.

Properly applied, Flintdek will not chip, crack or peel. And it provides a safe, non-slip surface that can be opened to light foot traffic within 48 hours or less. It is best to avoid exposure to heavy traffic for a somewhat longer period, since full adhesion and final bonding will not occur for several days.

The new colors now available in Flintdek add even more safety and serviceability to this popular floor coating. You can coat your floor in:

Cement Gray **Visibility Yellow**
Slate Gray **Green**
Tile Red

Choose the color that fits best with your decorative and visibility requirements.

Write today for *your free folder and sample. The Flintkote Company, Industrial Products Division, 30 Rockefeller Plaza, New York 20, New York.*

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Because it's BLAW-KNOX "TWISTED BAR" Electroforged Steel Grating

IT'S the twist that does the trick . . . the twisted bar construction gives greater traction, makes slipping impossible even if the grating is wet, greasy, or covered with snow. The slightly roughened surface grips shoe soles for *extra* safety, yet the over-all surface is level for confident ease in walking and standing. Trucks and other wheeled vehicles roll freely.

In addition, Blaw-Knox Steel Grating is *electroforged* into one piece for extra strength and load bearing durability.

Blaw-Knox Electroforged Stair Treads available with rolled diamond checker plate nosing (illustrated), twisted crossbar nosing or abrasive nosing.

GET ALL THE FACTS

FROM BULLETIN 2296

Big new Bulletin gives complete construction details, specifications, numerous possible applications and all the outstanding advantages of Electroforged Steel Grating and Stair Treads. Write for Bulletin 2296 today!

LOOK AT THESE OTHER ADVANTAGES

Maximum open area for light and air • Self-cleaning—no sharp corners to clog • Easy to maintain and paint • Economical to install.

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Keeps Floors Safe And New-Looking

Skidproof gives any type of floor — wood, linoleum, rubber, asphalt, tile or terrazzo — a hard, durable slip-proof surface that protects against the toughest kind of wear. It's easy to apply, easy to clean. It's quick-drying, odorless, economical — one gallon covers 2000 square feet!

Skidproof overcomes the slipping hazards of ordinary wax — makes rubber burns, stains and surface damage easy to get off — won't crack or check — won't discolor any floor surface. It's the finest surface finish available to keep floors shining, beautiful and safe!

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You can depend upon Con-Sol Products for every maintenance problem — cleaning, insect or bacteria control, floor upkeep, health and safety.

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CONSOLIDATED CHEMICAL LABORATORIES, INC.
1470 S. VANDEVENTER . . . ST. LOUIS 10, MO.

Light

(From page 15)

per watt, low operating cost and long life. They require auxiliary equipment, which makes the initial cost higher, and have a relatively long restarting time. These characteristics and the less pleasing color of light have limited their use.

Mercury vapor lamps are used frequently for high bay mountings where areas are large. Where rough work is done, as in steel mills, they may be used alone. Where color discrimination is important, alternate fixtures of mercury and incandescent lamps are used.

Several types of mercury-vapor lamps are available. The pressure at which the lamp operates accounts in a large measure for the color of the light produced.

Glow Lamps. These lamps are used as signal, pilot or night lights. They are not practical for general illumination.

Reflectors. No lamp should be used without a suitable reflector. There are several factors to be considered in choosing the types of units:

1. Desirable distribution of light and suitability for the interior involved.
2. Sturdiness of construction.
3. Efficiency of light output.
4. Adaptability in case more light is desired.
5. Economy of cleaning and replacement.

Special Lamps and Fixtures

Where lighting equipment is subject to abnormal conditions of service, special types are available.

Vibration-resisting lamps give greater service where ordinary lamps would have a short life because of excessive vibration.

Weather-resistant lamps are used for outdoor lighting in industrial plants, docks, athletic arenas, etc. They stand exposure to rain, sleet and snow without cracking.

Explosion-resistant fixtures are used where dusts, gases, fumes and vapors may create a hazardous atmosphere.

Infrared lamps, now available in types and sizes up to 1000 watts, are being used increasingly for baking, drying and heating processes, as well as for therapeutic use.

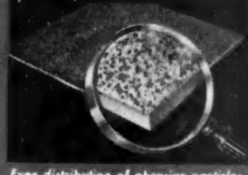
Where changes in lighting requirements vary from time to time, lighting fixtures are mounted on overhead trolleys. Fixtures can be moved to other parts of the plant or rolled to any location along the line. Such systems can be adapted to either incandescent or fluorescent fixtures.

—To page 30

NOW! END SLIPPING ACCIDENTS WITH A.W. ALGRIP

(POSITIVE NON-SLIP FLOOR PLATE)

Non-slip—Even on Steep Inclines



Even distribution of abrasive particles shown by magnifying glass.

Prevents slipping on factory floors, walkways, etc.

Protects workmen and vehicles from slipping on ramps and loading platforms.

REVOLUTIONARY, NEW ABRASIVE ROLLED STEEL FLOOR PLATE

Now, for the first time you can prevent dangerous, expensive slipping accidents with A.W. ALGRIP ABRASIVE *Rolled Steel* Floor Plate. It's the non-slip floor plate that safety engineers, architects, purchasing agents and plant owners have always wanted.

A.W. ALGRIP is made by rolling abrasive grain as an integral part of the upper portion of *steel* plate. It retains its non-slip qualities for a lifetime, because as the surface wears new abrasive particles are constantly exposed.

Install A.W. ALGRIP for positive non-slip protection in all areas subjected to oil, grease or water on which men walk or climb . . . loading platforms, ramps, washroom floors, fire escapes, running boards and similar surfaces. A.W. ALGRIP prevents slipping even on steep inclines. And remember it's low in cost, easy to install, requires no maintenance, and is resistant to heat, fire and heavy traffic.

Write or use coupon for complete information about this amazing, new, non-slip floor plate now.

A.W. ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

A Product of ALAN WOOD STEEL COMPANY

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Other Products: PERMACLAD Stainless Clad Steel • A.W. SUPER-DIAMOND Floor Plate • Billets • Plates • Sheets • Strip • (Alloy and Special Grades)

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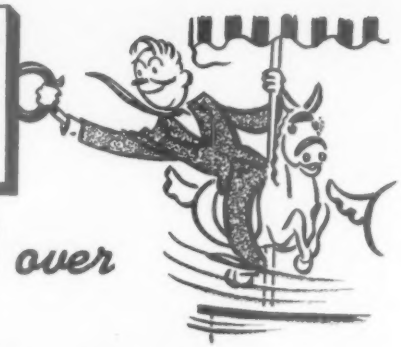

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Prevent Slipping and Falls—Provide Comfort Underfoot—Reduce Fatigue—Increase Production and Efficiency—Silence Footsteps—Promote Sanitation—Reduce Breakage

EZY-RUG COLORED RUBBER LINK MATTING
AMERICAN COUNTER-TRED SAFETY MATTING
AMERIFLEX FLEXIBLE WOOD LINK MATTING
COUNTRY CLUB RUBBER FLOOR TILE
TRAFFIC-TRED
TILE TOP SPONGE MATTING
PERFORATED CORRUGATED MATTING
NEO-CORD COUNTER-TRED SAFETY MATTING
TUF-TRED SUPERIOR GRADE TIRE FABRIC MATTING
DO-ALL ALL-PURPOSE RUBBER AND CORD MATTING
EVER-TRED VINYL PLASTIC LINK MATTING

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"AMERICA'S LARGEST MATTING SPECIALISTS"

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Maintenance. Efficient lighting requires a systematic program of maintenance. Equipment may meet all requirements when installed but dust and grime immediately start reducing light output.

The recommended method of establishing a maintenance schedule is to check the illumination periodically with a light meter. When illumination has decreased to 75 per cent of its original value, the lighting equipment should be washed with warm water and a detergent containing no free alkali.

Group replacement of lamps, both incandescent and fluorescent, is often practicable and desirable. It is based on the assumption that the saving in cost of replacing a large number of lamps at one time is greater than the value of the remaining light output in the lamps. The point of replacement is usually 60 to 80 per cent of the rated lamp life.

Disconnecting hangers permit lowering fixtures to the ground or floor for cleaning, relamping and repairs. Much climbing is eliminated.

Emergency Lighting. In plants where failure of the power system might endanger life, an emergency lighting system is desirable. In some states it is required under certain conditions.

For outdoor use it is often desirable to have searchlights, stationary or portable, which can be concentrated on critical areas when needed.

Another type is a portable system which can be moved to the scene of a fire or acccident.

Ventilation

(From page 14)

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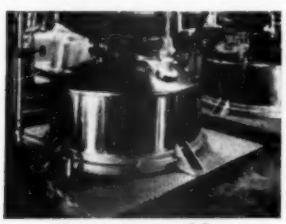
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FLINTKOTE
Products for Industry

Make your polished

THE LEGGE SYSTEM of SAFETY FLOOR MAINTENANCE gets a shine on your floors that's up to 95% ACCIDENT-PROOF

There's no need to choose between polishing floors at the cost of slip and fall accidents . . . or leaving them unprotected for safety's sake.

The experience of leading plants and buildings proves: With the Legge System of Safety Floor Maintenance you can polish floors to a high gloss . . . yet have a walking surface that is slip-resistant and reduces floor fall accidents up to 95%! It's accomplished by this simple plan:

1. Safety-tested materials

Legge Safety Floor Maintenance products have proved they are slip-resistant when applied . . . and stay so as long as they're on the floor. Buffing increases coefficient of friction. They are widely recommended by leading casualty insurance companies. And they are listed by Underwriters' Laboratories.

2. Safety-minded housekeeping

Legge Safety Engineers survey your problems and develop a safety maintenance program tailor-made to your needs. They teach your crews proper use of Legge Safety products, work-saving methods, safety on the job. They serve as your floor safety and maintenance consultants. Their services are free to Legge customers.

Safety floors cost LESS than slippery floors

Minimizing slip and fall accidents saves plenty. But the Legge System of Safety Floor Maintenance gives you a floor-upkeep plan that actually cuts your housekeeping costs, too.

A typical case: A large institution had to keep stripping its floors of old wax every night. With Legge Safety products and methods, a base polish coat lasts one or two months. Labor—usually 75% of the total cost of floor upkeep—is sharply reduced. Less materials are needed. And the floors are spared constant harsh scrubbings. The Legge System of Safety Floor Maintenance generally cuts floor labor costs up to 50% . . . and materials bills up to 25%.

With the Legge Safety System, each job function is performed scientifically, using materials that make it easier to do. For a list of the Legge Safety Products, see opposite page.

LEARN HOW the Legge System of Safety Floor Maintenance can give you slip-resistant, polished floors. A letter mentioning what types of floors you have and any special problems will bring specific suggestions. Or write for our free booklet, Mr. Higby Learned About Floor Safety the Hard Way.

Walter G. **LEGGE** *Company, Inc.*

Architects' Bldg., 101 Park Ave., New York 17, N. Y.

Branch offices in principal cities

LEGGE SYSTEM
of Safety Floor Maintenance

floors SAFE floors

The LEGGE SYSTEM of SAFETY FLOOR MAINTENANCE gives every floor a special Safety treatment

Legge Safety Floor Cleaners

TEXINOL A concentrated, all-purpose pine oil cleaner that is commercially neutral. May be used on all surfaces that water will not harm. Cleans by softening and loosening dirt, rather than by caustic or abrasive action. In concentrated jelly form, a small amount in a pail of water provides an effective, economical cleaning solution.

CLEANER #1 A primary floor cleaner formulated to remove accumulated wax and dirt. Generally used where vigorous cleaning measures are needed to prepare floors for polishing. Commercially neutral. Cleaner #1 is a concentrated paste compound used to cope with unusual problems. Will not mar surface nor bleach color.

TEXSPAR A heavy-duty scrubbing compound reserved for exceptionally stubborn accumulations of old wax, soap film and ground-in dirt. Texspar has removed stains and accumulations of foreign matter that have for years resisted every known cleaner. A commercially neutral paste compound.

TRAFCO CLEANER A solvent type floor cleaner used in conjunction with Trafco floor polish. Loosens and removes dirt, old wax and rubber "burn" marks. Contains some polish. Cleans and renews both polish and slip-resistant qualities at the same time. It is applied to floor and scrubbed with steel wool to loosen dirt.

SPIRCO CLEANER A solvent type floor cleaner used in conjunction with Spirco floor polish. Has the same action and is used in the same manner as Trafco Cleaner.

Legge Safety Floor Polishes

*__LECO__ - *for resilient floors.* A Safety, water-emulsion floor polish designed for use on linoleum, rubber, cork, linotile, Koroseal and similar flooring. Produces a high gloss; yet remains slip-resistant at all times. Protects floor with a tough, durable polish film. Its coefficient of friction can be increased to meet unusual slip hazard conditions.

*__SAFCO__ *for asphalt tile floors.* A Safety, water-emulsion floor polish similar to Leco except that it has a higher safety factor for the harder surface of asphalt tile floors.

*Listed by Re-Examination Service of Underwriters' Laboratories.

For best results, both Leco and Safco are applied with a mop. They can be diluted for touch-up of worn polished areas and can be used in this manner for follow-up cleaning as well.

*__TRAFCO__ *for wood and cork floors.* A solvent type floor polish specially formulated for wood floors that receive heavy traffic, but also suitable for cork, linoleum and similar resilient floors—*except rubber and asphalt tile.* Provides a highly durable, glossy, slip-resistant polish surface. Has a solvent action which permits its use in follow-up maintenance as a combination cleaner and polish.

*__SPIRCO__ *for wood floors.* A solvent type floor polish for wood floors. Similar to Trafco except that it provides a greater safety factor.

*__FLOORSHINE__ A cleaner specially formulated for Safety maintenance of terrazzo, marble, travertine, quarry and other hard-surface floors. A Safety floor polish and neutral cleansing agent combined, used in water in place of soap or soap powder. Makes an effective one-step treatment that cleans and produces a slip-resistant surface. Accentuates true color of floor. Also effective for follow-up care of floors polished with Leco, Safco, Trafco or Spirco Safety Floor Polishes.

All Legge Safety Products retain conductivity of conductive floors.

OTHER LEGGE PRODUCTS

GRIPTEX A Safety powder sprinkled on floors that are made slippery by temporary wet or oily conditions . . . such as vestibule and entrance floors during wet weather, kitchen floors; also in factories, around machinery or on loading platforms. Griptex is sprinkled on floors when wet or oily. Tiny abrasive particles bite through spillage to give slip-resistant footing — yet do not scratch the floor. Useful in stores, restaurants, public buildings, factories, etc.

GUMROK A slip-resistant plastic like composition in heavy liquid form. Used on metal, concrete, wood or other surfaces at all slip hazard points on factory floors, stair treads, ramps, around machines, etc. Dries in a few hours to a tough, abrasive surface that bites through spillage of oil, grease or water. Resists most acids. Is applied with a screed, trowel or brush to thickness of approximately 1/16". Available in colors red, brown, black and green.

NOSTAT *Grounding Device* A grounding device for personnel to insure effective drainage of static currents from the body to a conductive floor. Makes contact with the skin through a leg garter. Connecting bead-chain carries currents to floor contact button that is clipped on shoe. Insures positive skin-to-floor contact.

CEMENT SEAL A penetrant that prevents dusting and seals the pores of cement floors against absorption of foreign matter.

*__CONDUCOTE__ For conductive safety. A plastic like composition that, when applied to a floor over a thin copper grid, produces a smooth walking surface that is properly conductive . . . dissipates static that may cause explosions. Is painted on floor over grid in 1/16" coat . . . dries to a seamless, durable, easy-to-clean finish. Makes most floors conductive of static electricity. Listed by Underwriters' Laboratories.

DAMP-SWEEP TOOL A maintenance instrument specially designed for faster, more effective damp-sweeping of floors. Consists of 20" brush, 5' handle connected by a universal joint, and 40" square sweeping cloth with taped hole at center. Unusually maneuverable; particularly efficient in removing fine grit from floors.

TERRAZZO SEAL A penetrant for terrazzo and other hard-surfaced floors. Accentuates true coloring; seals the floor against penetration of dirt and foreign matter.

WOOD SEAL A durable seal and surfacer for fine wood and gymnasium floors. Protects floor against deterioration and keeps out dirt and foreign matter.

Ladders

(From page 32)

plete circle and elevated at various angles from 45 to 72 degrees from the vertical.

This device permits working over parked vehicles and is used for such jobs as tree trimming, servicing street lights, police and fire alarm signals, inspecting overhead lines, connecting house services, and general emergency work. It can be lowered into compact form for traveling.

Ladder Accessories

Whenever a portable ladder is used on anything but dry ground, there is always danger of the feet slipping. To overcome this hazard, several types of ladder shoes have been devised. In general, they grip the surface either by sharp points or by friction.

One type of sharp point is the metal spike; another is the abrasive shoe. The friction type includes those shoes which depend upon frictional resistance for the gripping qualities, such as cork, lead, and rubber or composition with interwoven cord.

Another type made of cotton asbestos material and interwoven wire combines the two principles. Suction cups are used in still another type.

Ladder shoes become less effective through wear, especially when exposed to oil and grease on the floor. Consequently, they should be inspected regularly.

Ladder Maintenance

Inspection. Among things to look for are: Loose rungs or steps; screws, bolts and other metal parts broken or missing; cracked, or broken uprights, braces, steps or rungs; slivers; worn or damaged shoes.

All ladders found defective should be marked and taken out of service and not used until defects have been corrected. If beyond repair they should be destroyed promptly.

Records of the condition of all ladders should be kept.

Storage. Ladders should not be stored where they will be exposed to weather. They should not be stored near radiators, stoves or steam pipes.

Protective coatings. Two coats of linseed oil or spar varnish will increase resistance to weathering.

Paint as a protective coating is now approved by the ASA Code, provided the ladders are inspected before painting by experienced inspectors acting for and responsible to the purchaser and the ladders are not for resale.

Wood preservatives, which consist of toxic chemicals in non-aqueous solution, prolong the life of wood exposed to weather or in contact with the ground. They offer special protection at the joints of rung holes and tenons. Some of these preservatives do not interfere with subsequent painting and varnishing.

Get DRI-RITE Protection

From Your Local Distributor

For further information contact

THE DRI-RITE COMPANY

(Water, oil and grease absorbents)

100 WEST CHICAGO AVE.

CHICAGO 10, ILL.

(In Canada: Safety Supply Co. — Halifax, Montreal, Toronto, Winnipeg, Edmonton, Vancouver)

No Trick at all!

AVOID SLIPPING ACCIDENTS

with

Oil-Dri

ABSORBENT

Absorbs all types of Oils, Greases and Fats from Floors

Oil-Dri ALL-PURPOSE ABSORBENT

Absorbs all types of Oils, Greases and Fats plus Water and Soluble Oil Solutions from Floors

EASY TO USE...
Just put it on grease spots

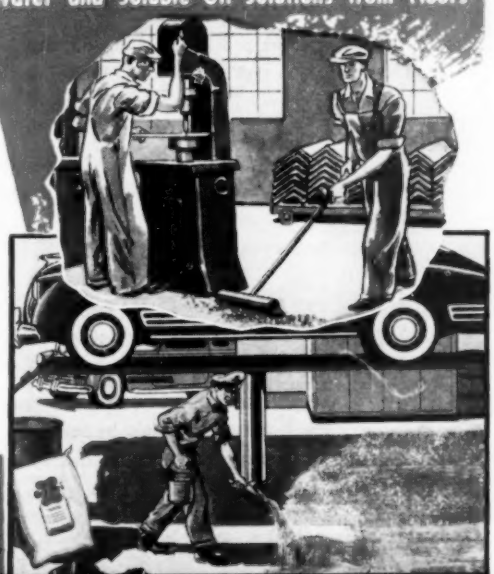
ECONOMICAL...
Saves time - Saves labor

Ideal for:
- Restaurants
- Taverns
- Machine Shops
- Factories
- Breweries
- Service Stations and Pits
- Garages
- Repair Departments
- Power Plants
- Kitchens and Food Plants
- Elevator Pits

CHECK THESE ADVANTAGES

1 Reduces slipping hazards 2 Reduces fire hazards 3 Improves floor conditions 4 Reduces maintenance labor costs 5 Reduces insurance penalties 6 Improves working conditions 7 Permits safer, easier, faster walking on plant floors 8 Improves plant housekeeping

DONT PUT IT OFF--PUT IT ON!



Manufactured Exclusively by

Oil-Dri Corporation OF AMERICA

520 N. MICHIGAN AVE.
CHICAGO 11, ILLINOIS

There'll be a HOT TIME *in the machine shop tonight*

Wherever floors are coated with oil, fire is an ever-present danger. The safe, low-cost way to guard against flash-fires and fires resulting from carelessly dropped matches and cigarettes is to use ***Wyandotte Zorball****.

Zorball is the nonflammable, all-purpose floor absorbent. It absorbs oil, grease, paint and other liquids quickly and efficiently. It provides stained floors with an immediate anti-slip surface and will not support flame under normal exposure, even when saturated with oil.

Zorball is easy to use. It is simply spread over the soiled floor and then swept up when saturated. It will not irritate the skin of those who handle it.

Your Wyandotte Representative is ready to show you how you can reduce fire and slipping hazards in your plant or shop with Wyandotte Zorball. Why not give him a call today?

**Wyandotte Zorball is listed by Underwriters' Laboratories, Inc.*

WYANDOTTE CHEMICALS CORPORATION
Wyandotte, Michigan • Service Representatives in 88 Cities

Wyandotte
REG. U. S. PAT. OFF.

SAFETY INSPECTION
(Check List of Mechanical Items)

THIS comprehensive check list may be broken up and parts of it assigned to individual group or department inspectors by underlining certain classes of the items:

1. Machines and equipment, belts, oiling devices, tools and appliances.
2. Guards and safety devices.
3. Ropes, tackle, chains, all hoisting equipment.
4. Conveyors, trucks, overhead cranes, track cars, motor vehicles, wheelbarrows, elevators, switching tracks and equipment.
5. Electric motors, switches, wiring, all accessory equipment.
6. Ventilation; dust protective equipment, fans, exhaust systems.
7. Acids, caustics, chemicals, gases; their storing and methods of supplying by means of containers, pipes, valves and other equipment; explosive materials; cutting oils and compounds.
8. Heating and power equipment, boilers, engines, power line shafts, and all accessories; fuel storing and firing equipment.
9. Materials in storage; piled materials; safe floor loads.
10. Fire hazards; fire fighting equipment.
11. Lighting—natural and artificial.
12. Housekeeping.
13. Protective clothing; emergency and other personal protective equipment.
14. Sanitation and hygiene.

SAFETY INSTRUCTION CARD No. 333

Roof Anchorage

Experience of insurance companies indicates the value of roof anchorage in protecting industrial buildings against damage from windstorms.

Standard roof anchorage is designed to resist gust velocities of 90 m.p.h. In most cases this will protect against minor tornadic storms and reduce the extent of damage outside the vortex of severe tornadoes.

The vortex of a tornado rarely strikes a plant but there are many storms sufficient to tear off plank-on-timber of joisted roofs that are not anchored on. Such forces are encountered frequently in hurricanes, severe gales, and thunder squalls as well as in minor tornadoes and in zones on either side of the vortex of a major tornado.

Small Plant Big Loser in Accidents

The big loser in industrial accidents is the small firm, states an article in the December issue of the *California Safety News*, which points out that from 70 to 80 per cent of the cost of occupational accidents in California are paid by the owners of small firms.

Of the California total of over $230,000,000 a year in accident costs, the small plant owner pays more than $173,000,000.

The fact that the small plant owner suffers heavily from the lack of a well-organized safety program is illustrated by figures given in the *California Safety News*. While plants with over 500 workers had an accident frequency rate of 10.13—a little over 10 disabling injuries for each million man-hours of work—plants with 100 workers or less had a frequency of 21.94, or more than double.

Floors

(From page 22)

n tural state but may become slippery when highly polished.

Rubber is used extensively because of its resiliency and high di-electric strength. It is affected by oils and solvents. Rubber with abrasive imbedded in the surface is used for stair treads, elevator sills, thresholds, etc.

Wood block has many of the essentials of a good, general purpose, heavy service floor. Such a floor is not likely to crack, become slippery or cause fatigue. It is comparatively noiseless. Individual blocks can be replaced easily.

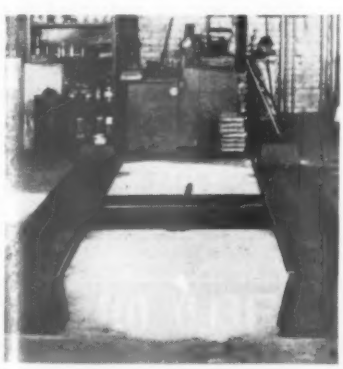
Blocks should be set in high melting point pitch, since ordinary pitch or tar filler may stick to wheels and shoes in hot weather. Wood blocks laid in mastic do not require pitch or tar filler.

Wood Plank. Hard, close-grained wood provides a floor that is comfortable under foot and reasonably durable under foot traffic. Under moist conditions, boards have a tendency to swell and buckle. A heavy sub base enables the surface flooring to withstand moisture and traffic. Unless well maintained, boards may loosen or break through under heavy traffic, creating dangerous conditions.

Fabric surfacing. Heavy fabric coated with mineral grains is used indoors and out for stair treads, ramps and around machines. The material is applied to concrete, metal or wood with a special cement. It wears well and is resistant to water, oil and weather.

Steel plates are serviceable for platforms, walkways, floors, hatchways. They wear well and are easily cleaned but are highly conductive of heat and are noisy.

The plates are made with checkered extruded patterns which offer resistance to slipping. When worn,



Floor drying compound reflects considerable light while absorbing spilled oil and water. (Eagle-Picher Company).

DIRTY FLOORS A MAJOR CAUSE OF FALLS IN INDUSTRY!

Findings of National Bureau of Standards

"The National Bureau of Standards found in a series of exhaustive tests that floors became considerably more slippery when dirty... in most cases, twice as slippery."

Standards

HILLYARD TREATED FLOORS

Won't Let You Down! They're CLEAN-SAFE!

That's why Industry depends on Hillyard Care. Hillyard Care keeps floors dirt-free and safe . . . reduces accidents, increases efficiency, protects your investment in floors . . . keeps maintenance costs at a minimum.

ANTI-SLIP SUPER SHINE-ALL

CLEANS UP ON FLOOR ACCIDENTS

Hillyard's wonder cleaner goes to work instantly—cleans dirt and grease from floors easily. Works on all types of floors . . . not a soap, but a neutral liquid chemical cleaner that leaves no slippery film . . . requires no rinsing. Just mop it on, squeegee or damp mop it off. Approved by Underwriters' Laboratories.

NON-INFLAMMABLE KURL-OFF

Removes old paint and varnish easily, safely, from floors, woodwork, machinery with no fire hazard.

SLIP-RESISTANT HILCO-LUSTRE

This Floor Renewer seals out dirt, seals in bright clean surface. Resists heavy traffic-wear. Won't water spot. Approved by Underwriters' Laboratories as "Anti-Slip."

Ask your nearest "Maintaineer" about these HILLYARD PRODUCTS today . . . or write to

HANDLE WITH HILLYARD CARE!

St. Joseph, Missouri, U.S.A.

2318 Wycliff St., St. Paul 4, Minn.

CAL-FLOR-DRY has been used *continually* in many Plants for many years.

Reg. U.S. Pat. Off.

A little goes a long way. Cal-Flor-Dry is economical to use. Its absorptive ratio is exceptionally high—over 120% of its own weight in oils, greases, including soluble, and other liquids. Cal-Flor-Dry keeps floors safe against slipping accidents. It is proved effective also as a fire preventive. Many use it to help prevent dermatitis.

Ask your Jobber Salesman, or write direct.

The FLOR-DRY Company

"Matty" presents the BIG 3

SAFETY · PERMANENCE
CLEANLINESS

You get them all with DURABLE mats . . .

SAFETY — With Durable mats your floors are safe, your employees safer. Floors are protected from wear and dirt — employees work on fatigue relieving rubber — accidents are cut to a minimum.

PERMANENCE — Durable mats are a long term investment — thousands of them have seen hard service for ten years and more.

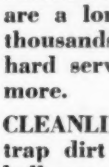
CLEANLINESS — Durable mats trap dirt under the mat, keep hallways and work floors clean. They're easily rolled to remove trapped dirt.

There's a Durable mat for every purpose. Ask "MATTY" about Durable for durability.

DURABLE

MAT COMPANY

75 N. Pleasant St. Norwalk, Ohio
2926 16th Ave., S. W. Seattle 4, Wash.



Dear Matty:—
Please send us Durable information on Safety Mats for _____

_____

_____

SN

plates can be roughened with a welding torch.

Steel plates are also used over ducts which carry electric circuits or pipe lines. They can be removed easily for servicing equipment underneath.

Abrasive metal plates are used for thresholds, elevator sills, stair treads, and other locations where a dirable, non-slip surface is essential. These plates with abrasive particles incorporated in the surface are available in both steel and non-ferrous metals.

Conductive floors are important in the control of static electricity where explosives are manufactured or where flammable gases, dusts and vapors may form explosive mixtures. Conductive floors ground static electricity and stray currents.

Types of conductive flooring include lead, spark-proof mastic, magnesium oxychloride, conductive linoleum, conductive asphalt tile and conductive rubber.

Floor mats are often useful to reduce slipping hazards and to provide a comfortable footing on hard, cold or damp floors.

Mats are made of wood, rubber, synthetic rubber, and plastic. Synthetic rubber, with cord-on-end construction, is a satisfactory type where the mat is exposed to oil and grease.

Mats should preferably have beveled edges or be set flush with the floor.

Scaffolds

(From page 24)

Species and grades of lumber recommended for scaffold planks include:

1. Douglas Fir, select structural plank.
2. Southern Pine, merchantable structural longleaf plank and dense structural square edge and sound plank.
3. Larch, structural plank.
4. Norway Pine, select common.
5. Eastern Spruce, select common.
6. Tamarack, select structural plank.

The structural grades of lumber should be used for scaffold planking wherever possible. The American Railway Engineering Association and the American Society for Testing Materials have adopted a system of grading joist and plank in which the grade named includes the rated strength (in pounds per square inch). These grades are based on accepted principles of strength grading, and may be used at the rated strength.

Where structural grades of planking are not available, each individual plank should be carefully inspected

Dry cleans OILY, GREASY SLIPPERY Floors!

Approved by UNDERWRITERS LABORATORIES, Inc.
Canfield OIL-SPUN
50 LBS. NET
KEEP IN DRY PLACE
Canfield OIL-SPUN
(SOAKS UP OIL AND GREASE)
SPEEDILY AND THOROUGHLY SOAKS UP AND CLEANS OFF OILY, GREASY CONCRETE AND WOOD FLOORS, DRIVEWAYS, LUBRITORIUMS, PITS, METAL RUN-WAYS, ETC.
UL
SPRINKLE it on...
RUB with broom
SWEEP it off...
THE CANFIELD OIL COMPANY

★ Prevents Fires
★ Prevents Slipping
★ Covers more floor
★ Absorbs more oil

Tried and proven in Canfield's own oil and grease plants!

Write for sample and literature

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AMAZING LIGHTNESS

MAGCOA DOCKBOARDS

...made of Magnesium

MAGCOA Dockboards made of magnesium, the "miracle metal", can be handled by one man without the aid of truck, chain or hoist. They weigh less than a third as much as steel boards of comparable size and strength, and are reinforced like a bridge to carry extremely heavy loads. Their lighter weight speeds up loading and unloading operations . . . cuts down danger of hernia and mashed feet or hands. Non-sparking magnesium eliminates explosion hazard, too. Every MAGCOA Dockboard is designed to the particular requirements of your docks. Write us for further information.

If lightweight magnesium is applicable to any of your products, our facilities warrant your serious consideration.

Our Materials Handling Line Includes MAGCOA Hand Trucks, Barrel Skids and Grain Shovels

Made of Magnesium

Magnesium DOCKBOARDS

MAGNESIUM COMPANY
OF AMERICA
EAST CHICAGO, INDIANA

EASTERN DIVISION—30 Rockefeller Plaza, New York 20, N. Y.
WESTERN DIVISION—831 S. Flower Street, Los Angeles 14, Calif.

to determine that it measures up to suitable standards for such use.

No planks of less than 2-inch nominal thickness (1-5/8 inch dressed) should be used. Planks less than 8-inch nominal width (7½ inches dressed) should not be used.

Railings and toeboards. Most codes require railings on scaffolds more than 12 feet high but railings are desirable on lower scaffolds. A top rail should be 36 to 42 inches above the floor with an intermediate rail half way between the top rail and the walkway surface. Toeboards are needed wherever men are working at elevated levels to prevent tools or materials from falling.

Overhead protection, consisting of planking heavy enough to stop any falling object, should be provided for scaffolds when men are working overhead. This protection should be not more than 9 feet above the working platform.

Sidewalk bridges. Where construction or repair work is carried on over sidewalks, protection for pedestrian traffic is needed. Sidewalk bridges of adequate strength are provided by the companies furnishing sectional steel scaffolding.

NOW...Links of VINYL PLASTIC bring You a Better FLOOR MAT

- Greater Resistance to Gas, Oil and Grease
- Longer Wearing Life
- Distinctive Beauty With Utmost SAFETY—

Here's the New Vinyl Link Mat that meets unlimited service applications.

KEEPS ITS NEW LOOK...

These Vinyl links outwear ordinary rubber links many times . . . Color stays clear and bright . . . They resist soil absorption, keeping their clean look longer. They are firm and resilient, giving continuous slip-proof SAFETY. They resist oil, gasoline and grease — won't soften or damp rot. Assembly of colored links permits optional designs in red, brown, green, white and black.

Trade Mark Registered MELFLEX

IN STANDARD COMBINATION OF COLORS and SIZES — Or Made To Your Specifications —

Standard pattern shown above: Black with red link border and center in 17" x 25", 18" x 30", 24" x 36", 30" x 48" . . . Made also to your requirements in size and color design . . Write today for full story and prices.

MELFLEX PRODUCTS COMPANY, Inc.

L. E. WARFORD, President

410 S. Broadway, Akron 8, Ohio — In Canada: P. O. Box 411, Fort William, Ont.

How Good Is Your Office Layout?

For efficiency, convenience and safety, good layout is important in the office as well as in the factory. Many of the same principles of work-flow apply equally to both. Light, ventilation, and employee services are important for any type of employment.

These basic details of office arrangement were compiled by the Knoxville Chapter of the National Office Management Association:

1. Work should flow through the office with a minimum of backtracking.

2. The transportation distance of work should be at a minimum. If possible, desks should be so arranged that each worker will receive his work from the person behind or beside him.

3. Employees using the same machine should be grouped.

4. Noisy machines should be segregated wherever possible.

5. Desks should face in the same direction, unless two employees are working together, in which case they may face each other.

6. Employees should not face the light or any source of glare.

7. Employees who do the closest work should be located nearest the light.

8. Individuals who have frequent callers should be near entrances.

9. Employees should be placed in front of or around the person having authority over them.

10. Aisles should be at least three feet wide; hallways should be at least four feet wide.

11. For desks facing in the same direction, the absolute minimum distance between the back of one desk and the front of another should be 2½ feet.

12. Files should be placed against walls or railings if possible.

13. Exceptionally heavy equipment should be placed against walls or columns.

14. Private offices should be limited. A large open space is better than the same space cut into smaller rooms, because it facilitates control and communications, provides better light and ventilation, reduces space requirements, eliminates partition costs, etc.

15. Where private offices are necessary, they should not be so placed that they cut off natural light or ventilation from employees working in adjoining rooms.

Windowless Plants Bring New Problems

When exterior windows of a plant are bricked up for installation of air conditioning, new problems in fire fighting may be introduced. These are more complicated in multi-story buildings with combustible floors and roofs.

Lack of access and delay in effective use of hose streams from outdoor hydrants may hamper extinguishment when there are no windows. Another difficulty is lack of ready means of smoke ventilation.

Automatic sprinklers would extinguish an ordinary fire as in any other building. But, if the fire is shielded, or if sprinklers happen to be shut off, serious consequences are likely.

Continuing liberation of heat and smoke would make it difficult to locate and attack a fire. This would be further complicated if the lighting system were put out of service. If the fire reaches the stage where the building cannot be entered, and if the building has combustible floors and roof, destruction is almost certain.

Air-conditioning equipment should be arranged so that it can be used for smoke ventilation in case of fire, **Factory Mutual Record** recommends. This is contrary to recommended practice for buildings of usual construction, where air-conditioning fans are shut down immediately at the start of a fire, and the area is vented by opening doors and windows.

To ventilate by the air-conditioning system, it is necessary to provide: (a) louvers in outside walls which will open at very low positive pressures; (b) fire dampers in return duct systems arranged for automatic closing by thermostats or photo-electric cells in case of fire. With such an arrangement and fans running, smoke will be forced out through the louvers.

Additional exits for personnel and means of access for firemen and hose streams may be necessary. Ample standpipes for 2½-inch hose in stair wells or just inside fire escape access doors, and water-flow alarms on all sprinkler risers should be provided.

Fire brigades should be well drilled and should know what to expect in fighting fires in windowless, air-conditioned areas. Their equipment should include smoke masks and portable lights.

Safe Storage

Fires in storage areas are responsible for more than one-third of the total damage in plants insured by Factory Mutual Insurance Companies, according to *Factory Mutual Record*. Such fires do not occur as frequently as fires in manufacturing areas but they have caused on the average more than seven times the damage per fire.

Fundamentals for safe storage include:

1. Keep storage out of manufacturing areas.

2. Keep storage from below manufacturing processes unless the building is non-combustible and floors are watertight.

3. Storage rooms need sprinklers if either the storage or the building will burn.

4. Store valuable materials in sprinklered building.

5. Don't overlook fire protection just because shed values are small.

6. Keep sources of ignition out of storehouses.

7. Keep storages in low, well separated piles.

A centrally located building to house the safety and medical departments. A border of flow r beds has since been added. (A. E. Staley Manufacturing Co.)

ACCIDENT CAUSES

I. FAULTY ENVIRONMENT

1. Hazardous Arrangement
   - (a) Unsafe piling and storage
   - (b) Congested working space
   - (c) Inadequate aisles, exits
   - (d) Unsafe processes
   - (e) Overloading
   - (f) No safe access to remote or high places

2. Unsafe Material and Equipment
   - (a) Rough and sharp-edged materials
   - (b) Inherently slippery surfaces
   - (c) Poorly designed and constructed equipment
   - (d) Low material strength (floors, hoisting equipment, etc.)
   - (e) Weakening of parts by rust, corrosion and decay

3. Illumination
   - (a) Insufficient light
   - (b) Glare
   - (c) Unsuitable location of light sources

4. Ventilation
   - (a) Insufficient air change
   - (b) Impure air source
   - (c) Contamination by processes
   - (d) Excessive heat

5. Moving Machinery
   - (a) Unguarded
   - (b) Inadequately guarded

II. THE HUMAN ELEMENT

1. Physical and mental characteristics
   - (a) Poor eyesight
   - (b) Defective hearing
   - (c) Muscular weakness
   - (d) Slow mental reaction
   - (e) Lack of coordination
   - (f) Heart, circulatory or other organic weakness
   - (g) Lack of nervous and emotional stability

2. Knowledge and Skill
   - (a) Ignorance of correct methods
   - (b) Faulty work habits
   - (c) Insufficient experience

3. Attitudes
   - (a) Indifference
   - (b) Inattention
   - (c) Indolence
   - (d) Arrogance
   - (e) Recklessness
   - (f) Hostility

ACCIDENT CAUSES ARE FOUND BY

1. Investigation of accidents
2. Study of plant accident experience
3. Studying accident experience of other plants
4. Plant inspections
5. Suggestion systems
6. Job analysis

A little of this goes a long, long way...

ELEKTRO-PURJ-IT
multi-purpose
CLEANING COMPOUND

solutions cost less than 2 cents a gallon!

Yes, today clean-up crews everywhere are discovering the sensational time and money saving features of job-proved Elektro-Purj-It! Think of it . . . *Elektro-Purj-It solutions actually cost less than 2 cents per gallon* . . . loosens dirt and grease faster, easier than you ever hoped possible! Elektro-Purj-It is dustless and non-caking . . . ideal for cleaning walls, floors, woodwork, reflectors, dadoes and machinery! Investigate Elektro-Purj-It today!

THE DIVERSEY CORPORATION
INDUSTRIAL MAINTENANCE DEPARTMENT, CHICAGO
IN CANADA: THE DIVERSEY CORPORATION (CANADA) LTD., TORONTO, ONTARIO

FREE SAMPLE

See for yourself the amazing difference Elektro-Purj-It really makes! Select a tough cleaning job in your plant and compare the outstanding cleaning action of Elektro-Purj-It with any other cleaner . . . compare and you, too, will be convinced! Mail this coupon for your free sample! No obligation.

THE DIVERSEY CORPORATION
Industrial Maintenance Department, Chicago
Gentlemen: Please send me at once my free sample of Elektro-Purj-It . . . that sensational, multi-purpose cleaner!

NAME .....
TITLE .....
COMPANY .....
STREET .....
CITY ..... STATE .....

Housekeeping

(From page 21)

Used absorbents may be used as sweeping compounds under certain conditions.

Disinfectants and deodorants are often useful, particularly around washrooms and garbage cans. They are not a substitute for thorough cleaning with soap and detergents.

Disagreeable odors may indicate unsanitary conditions or they may be merely a nuisance, but they cause discontent and often labor turnover. Every attempt should be made to remove them at the source but a deodorant may be needed at times.

Sweeping compounds are helpful in keeping down the dust where hand sweeping is used. The combustibility of the compound should be noted for some locations.

Paint. A fresh coat of paint is a tonic to any plant and an aid to morale and housekeeping. Lighting is improved and there is more incentive to keep the place clean.

On machinery light colored enamels have been found practical. They give the operator a better view of his work and encourage more careful maintenance of the machines.

SAFE
Footing on Oily Floors!

IT'S easy and economical... all you do is sprinkle Oakite Composition No. 71 over all floor areas where you find oil, grease, water and other hazardous accumulations.

Highly absorbent granules of Oakite Composition No. 71 quickly soak up liquids . . . make floors SAFE to walk on. Keep floors clean. HELPFUL details—yours for the asking. Write to:

OAKITE PRODUCTS, INC.
140 Thames Street, NEW YORK 6, N. Y.
Technical Service Representatives Located in Principal Cities of United States and Canada

OAKITE
SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

WHAT *Management* SHOULD KNOW about FLOOR-MAINTENANCE MACHINES

The area of a floor, whether it is congested or open, the type of flooring and whether it is easy or hard to clean — these, among other factors, determine the floor-maintenance equipment. For most effectual, economical floor care, choose accordingly.

For large-area floors, a combination scrubber-vacuum is the labor-saving answer. *Finnell's 213-P* applies the cleanser, scrubs, rinses if required, and picks up. Has a cleaning capacity up to 8,750 sq. ft. per hour!

For small-area floors, a 13" all-purpose machine, such as the *new 713 Finnell,* is a wise choice. This machine polishes, applies wax, wet- and dry-scrubs, light-sands, applies seal, steel-wools, and shampoos rugs! Yet it is priced incredibly low.

For grease-caked floors, a dry-scrubber with powerful scarifying brushes affords the fastest cleaning method. *Finnell's 84-XR,* with its self-sharpening brushes, cleans grease-caked floors in *one-tenth the time required when hand-spudding!*

For general use, average duty, substantial savings are effected with a *100 Series Finnell* — the machine that's *two sizes in one!*

For general use, heavy duty, with emphasis on polishing needs, choose a motor-weighted machine. An *800 Series Finnell* gives 8-way adaptability! . . . has *safety switch* on handle.

Because *Finnell* makes machines for every type of floor care — and in a wide range of sizes—you can depend on *Finnell* for unbiased advice as to the equipment that's *right* for your needs. For consultation, demonstration, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 2203 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

Everything FINNELL for Floor Care

FINNELL SYSTEM, INC.

Pioneers and Specialists in

FLOOR-MAINTENANCE EQUIPMENT AND SUPPLIES

BRANCHES IN ALL PRINCIPAL CITIES

HILD MAINTENANCE EQUIPMENT

for scrubbing and maintaining floors of all kinds and for scores of other dust-control and clean-up jobs

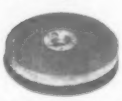
HILD Electrically Operated Floor Machine with solution storage tank mounted on handle

HILD Electrically Operated Floor Machine with plain handle

Patented HILD Shower-feed Brush for wet-scrubbing

HILD Power Scraper for dry-scrubbing

HILD Cup Brush for dry-scrubbing

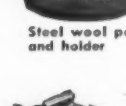


Brush for waxing or polishing

Steel wool pad and holder

Polishing buffer

Sanding disc



Grinding disc

HILD "All-Purpose" Vacuum Machine

"DRY-SCRUBBING" FLOORS—Stubborn, hard-caked grease and dirt removed from factory floors with Power Scraper or Cup Brush on HILD Floor Machine. Much faster than chipping off with hand spud, and does not mar floor or loosen wood blocks.

"SHOWER-FEED SCRUBBING" FLOORS—HILD System Shower-feed Scrubbing and Vacuum Drying permits scrubbing oily factory floors without interrupting production. Gets rid of the oily, slippery condition that causes accidents . . . leaves floors dry and slip-safe . . . easily gets around and under machines in close quarters.

SWEEPING FLOORS—No cloud of dust, no sweeping compound needed when floors are swept by this brush attachment on the HILD Vacuum. Removes loose dirt and dust from cracks in flooring.

CLEANING OUT BINS—Special attachment for HILD Vacuum used to remove dust and dirt from bins containing nuts, bolts, screws, rivets, etc. without removing the contents of the bin.

CLEANING PIPES—The pipe cleaning tool on the HILD Vacuum cleans overhead pipes without showering dust into the air or onto the floor below. Extension handle makes pipes easy to reach from the floor.

CLEANING WALLS—The HILD Portable Vacuum Machine provides an efficient dust-free method for cleaning walls of brick, concrete, etc. In many factories, HILD Vacuum Cleaning has satisfactorily prepared walls for painting . . . saved cost of washing.

WRITE TODAY FOR FREE BOOK

HILD FLOOR MACHINE COMPANY

740 W. WASHINGTON BLVD. DEPT. NS-3 CHICAGO 6, ILL

FLOOR·SAN®

MODERN CLEANING COMPOUND

FLOOR-SAN is a universal cleanser that's safe on every surface unharmed by water. Contains a water softener, emulsifying agents, synthetic detergents, and soap, carefully balanced and refined. Ideal for use on painted walls, woodwork, and rubber or metal fixtures as well as floors.

Safe on every surface

SEAL-O-SAN FLOOR SEAL* — A Tung Oil-Bakelite-Resin type floor sealer which penetrates into the pores of the wood, effectively sealing out all dirt, preserving and protecting the wood and beautifying floors.

NIP-AN-TUCK ROACH POWDER* — Sodium Fluoride-Pyrethrum roach powder which quickly eradicates all types of roaches.

DEE-REZ* — An insecticide consisting of 5% DDT in an odorless base, designed for use as a surface spray, with long-lasting residual kill. Effective against bed bugs and flies.

HUNTINGTON TOILET BOWL CLEANER — Forms an acid solution with water . . . safe on porcelain. Because each crystal is a perfect sphere, the powder will not cake in the can and small amounts may be poured without spilling.

BINGO DRAIN PIPE OPENER* — A very strong and active chemical solvent which will quickly dissolve the most stubborn obstructions in plumbing. It attacks and rapidly reduces all organic matter. Won't harm metal pipes or plumbing.

GLAS-SAN GLASS AND METAL POLISH — A cream type polish, for use on windows, glass, and metal work. Quick acting and thorough. Enhances surface of any metal. Makes windows sparkle.

NEO-SHINE WAX* is a self-polishing water-dispersed wax containing 18% solids. Made entirely with No. 1 Yellow Carnauba Wax. Its high quality and concentration assure long wear, high gloss and reduced labor costs. Safe on all floors.

SAFE-T-SAN LIQUID FLOOR POLISH — Reduces slipperiness of any floor surface. Easy to apply. Dries bright in short time. Protects floor like wax. Cannot harm the surface.

WEATHERALL SELF-SHINING WAX* — A self-polishing water-dispersed wax containing No. 1 Yellow Carnauba. Weatherall has special ingredients which give great water resistance. Stands up well under heaviest traffic.

SAN-PHENO X* — A powerful germicide with a pleasing odor. Non-irritating . . . safe on animate or inanimate objects. For all hospital uses. Phenol coefficient—10. Kills communicable disease bacteria and tuberculosis germ.

DERMA-SAN GERMICIDE* — A powerful fungicide of guaranteed germ-killing potency for sanitizing institution rooms and equipment. Also used to prevent athlete's foot in locker-room and showers.

CABINET-SAN is a highly concentrated deodorant formulated especially for hospitals. It quickly removes obnoxious odors when sprayed in rooms, corridors, cabinets and on fabrics. Available in both wick-type dispenser and hand-operated atomizer bottles.

ZEF-IR AIR SWEETENING PRODUCTS* — A special formula using Paradichlorobenzene. Blocs, Blockettes and Perfumed Crystals. Dense, long-lasting, because cold moulded under pressure. Pleasingly perfumed.

ANDY DISHWASHING CRYSTALS — An effective cleanser which contains no soap. Modern wetting agents are incorporated to give high penetration of soil. Completely soluble, free-rinsing.

POR-SAN PORCELAIN CLEANER* — A very fine porcelain cleaner containing specially selected, mild abrasive, soap and synthetic detergents. Can be used indefinitely without harm to porcelain.

*Registered, Huntington Laboratories, Inc.

FLOOR MACHINES

HOSPITAL DEODORANTS

HOSPITAL CLEANSERS

THE SILENT HUNTINGTON FLOOR MACHINE — 16" brush, ½ H. P. for heavy duty work, general maintenance, polishing and scrubbing floors. Ideal for hospitals and institutions.

HUNTINGTON LABORATORIES, INC.

HUNTINGTON, INDIANA — TORONTO, CANADA

Stairs and Ramps

STAIRS and ramps are permanent parts of the factory structure. They form vital arteries of traffic and, as such, deserve painstaking care in construction and upkeep.

Three types of passageways between different levels in common use are **stairs, ramps** or **inclines,** and **fixed ladders.** Used with reasonable caution, they are serviceable and safe within the following general limitations:

Stairs. Used where the grade is more than 20 degrees and less than 50 degrees from the horizontal. Long stair flights are to be avoided wherever possible. Landings every tenth or twelfth tread are recommended.

Ramps and inclines. A slope of not over 7 degrees (approximately 12½ per cent) is recommended. For grades between 7 and 20 degrees, a combination of stairs and level landings should be used. Some states prohibit the use in industrial establishments of ramps that exceed a rise of 1 foot in 10 feet of length.

Fixed ladders. Necessary for grades over 50 degrees. Permissible only when stairways are not practicable. Some states prohibit the use of ladders as a substitute for stairways.

Stairs

Treads and risers. Ratio between depth of stair treads and height of risers determines the angle or pitch of the stairs, which should be between 30 and 38 degrees from the horizontal. Tread depth and riser height must be constant for each flight.

Winders should be avoided. Wedge-shape treads make it more difficult to ascend or descend safely.

Treads must be deep enough that, in descending the stairs, the ball of the foot does not project beyond the nosing and the heel does not strike against the riser above.

The Building Exits Code specifies that treads of new stairs shall be not less than 9½ inches, exclusive of nosing. The Code also states that no stairs with a tread of less than 6 inches, exclusive of nosing, shall be permitted.

Risers should be not more than 8 inches nor less than 5 inches in height. Greater or less height will cause one to take an unnatural stride which may result in a serious fall.

Stairs subjected to severe use, as in public buildings, should have treads with a durable non-slip surface. Materials used for original installation or repairs include abrasive metal, steel with extruded patterns, plastic compounds, rubber and fabric with abrasive surface.

Railings and handrails. The American Standard Safety Code on Floor and Wall Openings, Railings and Toe Boards requires that every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails as specified.

Well constructed stairway and platform with standard railings and toeboards. Checkered steel plates are used for the platform and gratings for the treads. (Republic Steel Corp.)

Ramps and Runways

Ramps and runways are preferable to stairways when it is practicable to use them. They should be built to the least slope possible. Maximum recommended slope is 15 degrees—never over 20 degrees.

For wood ramps materials used in construction should meet the requirements for scaffolds. Width should be adequate for traffic and open sides should be protected with standard railings 42 inches high.

Toeboards should be installed where the ramp extends over a work place or passageway. Cleats 16 inches apart are needed on steep inclines.

Planks should not overlap and the length of the plank should run the long way of the ramp. Ramps used for wheelbarrows should have an odd number of planks with no cleats on the center plank. The width should be not less than 3 feet.

Ramps made of concrete are preferable for heavy traffic. Anti-slip surface can be obtained by rough floating or by incorporating abrasive in the finish coat. Hardeners and trowelling should not be permitted.

Concrete ramp with well-constructed curb and guard rails. A runner of rubber makes hand trucking easier.

When the surface of a concrete ramp has been worn smooth, it can be roughened by scrubbing with dilute nitric acid. The surface is then hosed to remove all traces of acid.

Ramps used for heavy vehicular traffic, such as power trucks and heavy duty hand trucks should have solid curbs in addition to the handrails.

Ramps included as parts of aisles and traffic routes should be as wide as the aisle to avoid bottlenecks.

Splinters, nails, irregularities, breaks and cracks in the surface are dangerous and should be repaired immediately.

Outdoor ramps should be kept clear of snow and ice. When necessary, cinders should be applied to give traction.

National Safety Council By-Laws Revised

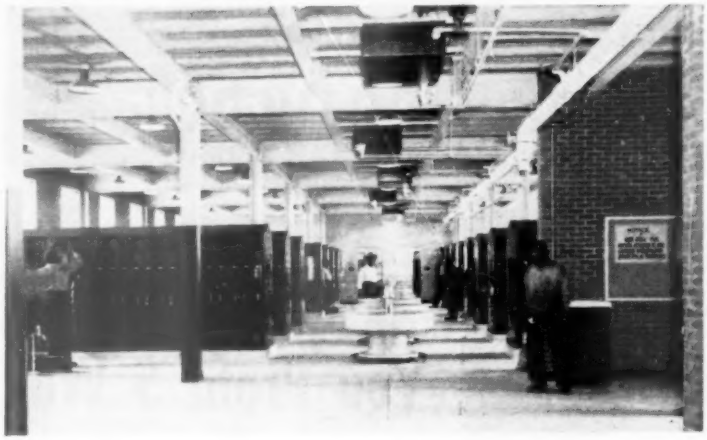
At a meeting of the Board of Directors of the National Safety Council on December 13, 1949, a revision in the Council's By-Laws was approved.

The effect of the revision was to change the methods and procedures in connection with the chartering of Local Safety Organizations. All such chartered organizations will henceforth be designated officially as Chapters of the National Safety Council, with mutual responsibilities and obligations, including financial assistance to the Council by the Chapters, and services to the Chapters by the Council.

The By-Laws revision also effected a change in the composition of the Conference of Local Safety Organizations. The Conference will henceforth be composed of not more than two representatives from each Class A Chapter, defined as those Chapters employing a full-time paid executive.

Any Council member may secure a copy of the revised By-Laws by addressing a request to the Secretary of the Council, at Headquarters.

Sanitary Facilities



Light-reflecting walls, ceilings and floors and modern fixtures are conspicuous features of this washroom. (General Steel Castings Corp.)

FACILITIES for personal cleanliness, comfort and convenience are often taken for granted by employees as long as they are satisfactory. But when washrooms, toilets and lockers are inadequate and poorly maintained, the company is bitterly criticized. A place to work that is pleasant as well as safe and healthful encourages better attitudes and attracts desirable workers.

Adequate attention to these facilities in planning industrial and commercial buildings will insure sufficient space and put them in the best relation to the functions they are to serve. Otherwise they may have to be fitted later into space that may not be suitable or convenient.

Many plants have outgrown their original service facilities. A survey of present equipment checked against the number of employees will show whether expansion is needed. Also, the equipment should be examined critically against modern hygienic standards — also from the standpoint of appearance.

Assistance in planning new quarters or improving existing facilities is offered by many manufacturers of washroom equipment and supplies.

Keeping washrooms and locker rooms clean is a never-ending job but high sanitation levels and low maintenance costs can be achieved at little extra cost when the buildings are planned. Rooms can be built without sharp corners, cracks, flat tops and fixture supports which are seldom cleaned satisfactorily. Floors and walls should be of material easy to keep clean.

Location. Depending on the size and type of plant and its operations, lockers, lavatories and toilets may be in one central location or scattered through the plant.

In smaller plants, washrooms and lockers are usually near the entrance.

Toilets should be near the workplace, not more than 200 feet away. In multi-story buildings, one on each floor is desirable; if not practicable, they should not be more than one floor above or below the work place.

Washrooms in large one-story buildings usually are scattered throughout the building. Isolated buildings are often considered separate units. Where there are many small isolated buildings, as in chemical plants and railroad yards, or where much of the activity is outdoors, a separate building may house all these facilities.

Accommodations should be located so that employees will not have to cross highways or railroad tracks to reach them.

When lockers and washrooms of a large plant are near the main entrance, small rooms with lavatories and toilets are often scattered through the plant. This saves the worker's time and makes it possible to close the main room during working hours, lessening danger of theft and requiring less supervision.

Separate washrooms and lockers are desirable for departments where there is exposure to excessive dust, dirt, heat, fumes, vapors, or moisture. These need more lavatories or shower baths than cleaner departments.

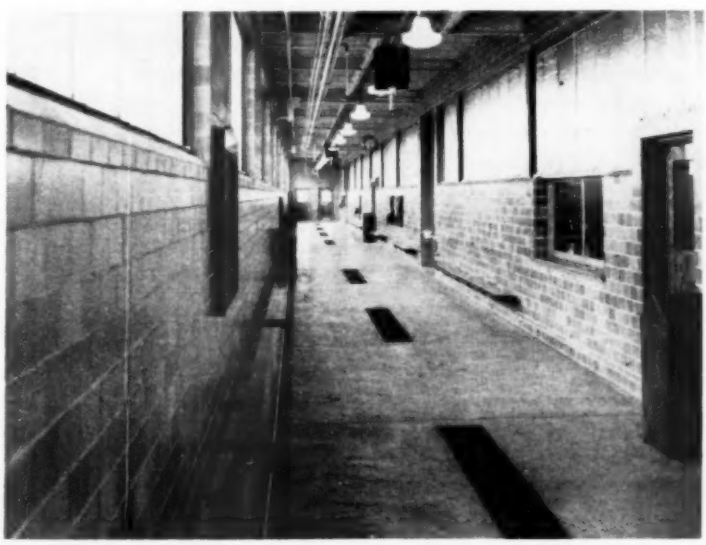
Offsetting the advantages of scattered facilities, is the higher cost of installation and maintenance. Centralized toilet and washing facilities are often preferable where women are employed. In some plants a full-time attendant may be needed.

Light and ventilation. Light fixtures should be installed to provide sufficient light in all parts of the room. Forced ventilation may be necessary to provide frequent changes of air.

The floors, and the walls to a height of at least six inches, should be of non-absorbent material, such as tile or concrete. Walls should form a tight joint at the floor level, or there should be a cove base at least six inches high.

Walls, ceiling and partitions should

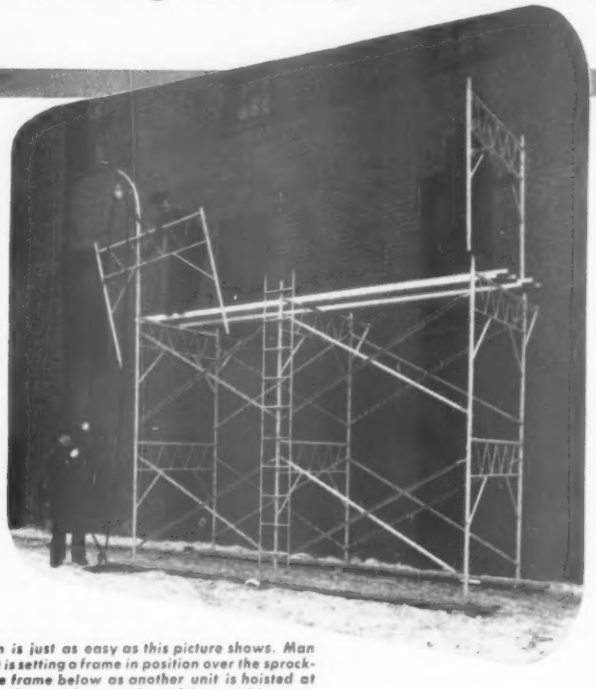
—*To page 52*



Designed for easy cleaning. This corridor in the employees' service building of Caterpillar Tractor Company has walls of salt-glazed brick and windows of self-washing, corrugated glass. Baseboards are rounded to facilitate washing and sweeping. Grate-covered pits in floor receive cigarette butts and light trash which can be removed by flushing with water.

Safer for every scaffolding job . . .

Money-Saving "TROUBLE SAVERS"



Erection is just as easy as this picture shows. Man at right is setting a frame in position over the sprocket in the frame below as another unit is hoisted at the left. Pivoted braces, slipped into position over stud bolts welded to the frame, are fastened with wing nuts.

You Profit 5 Ways:

1. **STRONG, SAFE** *"Trouble Savers"* save you the money that faulty scaffolding costs in accidents.
2. **QUICKLY ERECTED** *"Trouble Savers"* eliminate the endless loss of time required to build old-fashioned scaffolding.
3. **EASILY DISMANTLED** *"Trouble Savers"* reduce excessive man hours required to take down old-style scaffolding.
4. **LIGHT, COMPACT** *"Trouble Savers"* cut down the extra space required for storing out-dated scaffolding.
5. **LONG LASTING** *"Trouble Savers"* give lifetime service and save the cost of new scaffolding materials on every job.

PLAY SAFE! *Protect your profits!* Prevent costly accidents! Save time, labor and money by using "TROUBLE SAVERS" on all scaffolding jobs. Show your men that their safety is vitally important . . . they'll be quick to see the extra protection they get when working on "Trouble Saver" Scaffolding.

This new type of pre-fabricated tubular steel unit cuts scaffolding costs to an absolute minimum. "Trouble Savers" are quickly erected into an unlimited variety of designs to meet every need for interior or exterior scaffolding. *No tools are required.* Change to "Trouble Savers" *now* . . . and SAVE WITH SAFETY.

Adjustable Steel Trestles

- ***Strong!***
- ***Safe!***
- ***Economical!***

• Details of the quickly adjustable "Trouble Saver" Steel Trestle.

Write for

BULLETINS PSS-12 and PSS-13

THE STEEL SCAFFOLDING CO., Inc.

856 Humboldt Street **Dept. NSN** **Brooklyn 22, New York**

for sure footing off the ground . . .

Select GOLD MEDAL

LADDERS AND SCAFFOLDING

GOLD MEDAL LADDERS

It's practical economy to buy the best in ladders . . . and that means GOLD MEDAL—the safest, strongest and best suited to service and maintenance work. GOLD MEDAL Ladders conform to A.S.A. Ladder Code and are inspected and approved by Underwriters' Laboratories.

GOLD MEDAL SAFETY EXTENSION LADDERS are equipped with automatic safety locks, rope and pulley. Sizes: 16' to 52'

GOLD MEDAL SAFETY PLATFORM LADDER Wide platform, rung back, knee braces and truss rods. Sizes: 3' to 18' (height of platform)

GOLD MEDAL UNDERWRITER STEP LADDER Heavy duty, rung back, knee-braced and truss-rodded. Safety spreader. Sizes: 4' to 20'.

GOLD MEDAL SINGLE LADDERS. Made in standard sizes from 8' to 24'.

MAGNESIUM LADDERS

Light! Strong! Safe!

STEP LADDERS—Weight: approximately 2 lbs. per foot. Sizes: 4, 5, 6, 8, 10'.

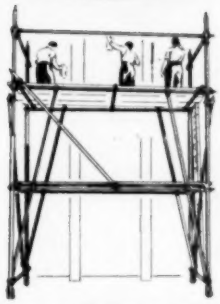
•

SINGLE LADDERS—1¼x1" half round rungs. Nine sizes; 8' to 20'.

•

EXTENSION LADDERS—1¼x3½" semi-channeled side rails. Automatic spring-type lock. Sizes: 16' to 40'.

All equipped with Rubber Grip Safety Shoes.



Tubelox Rolling Scaffold

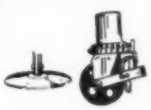
TUBELOX TUBULAR STEEL SCAFFOLDING

Easily-erected GOLD MEDAL Tubelox Scaffolding is the safest and most adaptable type for exterior or interior work. Only four simple, basic parts are used. Much stronger than wood, it's quickly erected and taken down. You save costly man hours! Curved surfaces, uneven ground, etc., are no problem with Tubelox Scaffolding. Tubelox is ideal for rolling scaffolds.

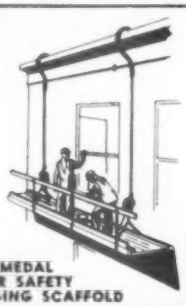
Tubelox tubes—in various lengths. Locking device between units forms them into continuous tubes.

Diagonal connection

Right-angle connection

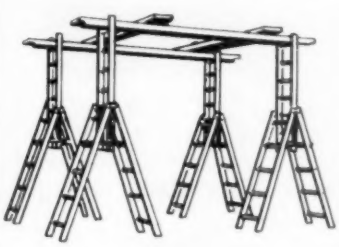


Choice of standard base or caster equipped with brake



GOLD MEDAL JUNIOR SAFETY SWINGING SCAFFOLD

Designed for many light duty operations, GOLD MEDAL Junior Scaffolds eliminate the dangers of rope tackle. Steel cables give extra safety. Machines are triple-locked at all times to prevent slipping.



GOLD MEDAL SAFETY EXTENSION TRESTLES

Unequalled for overhead work. Added strength provides extra safety. Sizes from 8' (extends to 10') up to 16' (extends to 28').

COMPLETE SCAFFOLDING SERVICE

Write for catalogs on the complete line of GOLD MEDAL Ladders and Scaffolds and tell us your scaffolding problems.

GOLD MEDAL LADDERS SCAFFOLDING

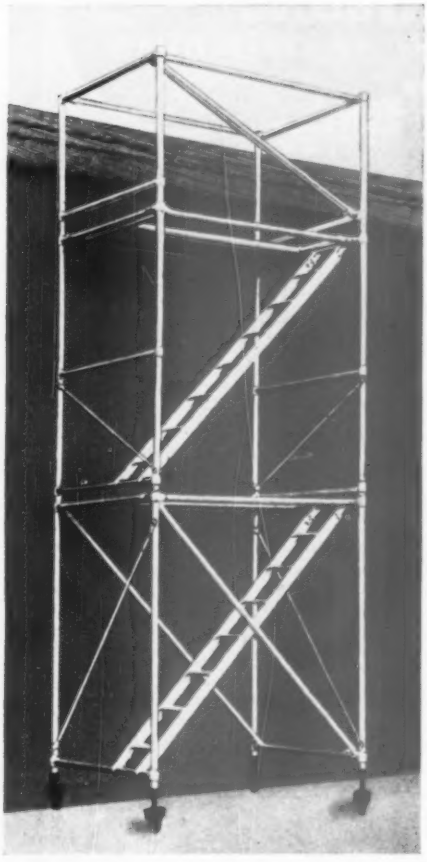
for Greater Safety . . . Efficiency . . . Economy

THE PATENT SCAFFOLDING CO., Inc.

Dept. NS • 38-21 12th St., Long Island City 1, N. Y.

BRANCH OFFICES: Atlanta • Boston • Cleveland • Dallas • Detroit • Kansas City, Mo. • Los Angeles • Miami • Milwaukee Philadelphia • Pittsburgh • St. Louis • San Francisco • Seattle

ALUMINUM ROLLING SCAFFOLD



Two Types—
Stairway Type (illustrated)
and Ladder Type

By the makers of Gold Medal Ladders and Scaffolding

For those who want the latest in rolling scaffold design, we offer the Aluminum Rolling Scaffold.

- **LIGHT IN WEIGHT.**
- **EASY TO ERECT — Aluminum makes parts light and easy to handle.**
- **SAFE—Cross bracing assures a rigid scaffold.**
- **VERSATILE — Interchangeable parts permit scaffold of one or more sections.**

Write for Free Bulletin

Tubelox Scaffolding is also available with Aluminum tubing.

GOLD MEDAL LADDERS SCAFFOLDING

for Greater Safety . . . Efficiency . . . Economy

THE PATENT SCAFFOLDING CO., Inc.

Dept. NS—38-21 12th Street, Long Island City 1, N. Y.

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MAINTENANCE MEN AND SAFETY ENGINEERS
agree on the many merits of
JOHNSON'S RUBBER LADDER SHOES FOR SAFETY

Top shoes prevent side slipping | Extension ladder shoes | Step ladder shoes are noiseless | For crutches and canes

Order from your dealer or

JOHNSON LADDER SHOE CO., EAU CLAIRE., WIS.

SAVING LIFE IS OUR LIFE

Sanitary Facilities

(From page 49)

be light in color to conserve light and encourage cleanliness.

Wash Fixtures

Where first cost must be considered a satisfactory fixture is an enameled trough over which are hot and cold water pipes with mixing faucets spaced not less than 24 inches apart. Double-width troughs or single-width troughs, back to back, save space.

Individual wash basins make an attractive installation but are more expensive. No stoppers should be used. Faucets should permit washing in running water.

Spray heads at basins or troughs are excellent for a thorough job of washing up. They should be high enough above the trough to permit washing head, arms and shoulders under the spray.

Mixing faucets, rather than separate faucets for hot and cold water, are recommended. Hot and cold handles should be plainly marked, with the hot water valve always on the left side. A desirable safeguard is thermostatic control of water temperature.

Group washing equipment. Wash fountains are popular in industrial

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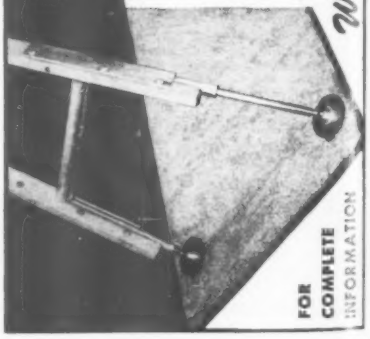

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- Single wall ladders

Write for folder on Industrial Ladders

SPECIFICATIONS FOR TYPE 400 LADDER

Model	Height to Platform	Width at Bottom	Weight
400	4′	23½″	20 lb.
401	6′	26¼″	28 lb.
402	8′	29″	38 lb.
403	9′	30¼″	44 lb.
404	10′	31¾″	48 lb.
405	11′	33¼″	52 lb.
406	12′	34¾″	56 lb.

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Handrails of steel guard the large roomy platform for added safety. Half of platform can be raised to form an extra step, when needed. These famous ladders can be set up instantly, are easy to carry and fold compactly for storing. Automatic locking feature insures safety while ladder is in use.

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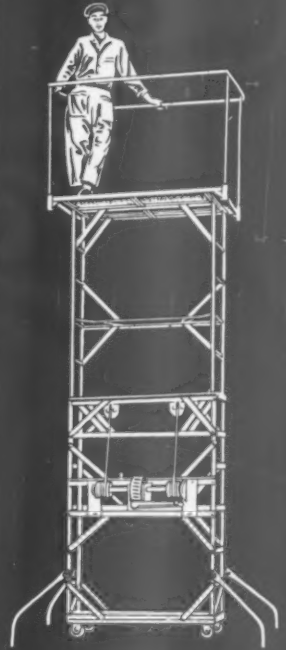

ATLAS INDUSTRIAL CORP.

866 39th St. Brooklyn 32, N. Y.

plants, institutions, schools, and other establishments where facilities must be provided for large groups.

These fountains will accommodate the same number of users in less space than would be required by individual washbasins. Reduction in the number of valves and plumbing connections effects additional economies and installation and maintenance.

Economy in use of water is another advantage. Several employees washing at a circular fountain use practically no more water than one person at an individual basin. Each user washes in clean running water at a regulated temperature. A foot or hand-controlled mechanism regulates the flow.

Semi-circular units of 36-inch and 54-inch diameter mounted against a wall are used for narrow or irregular washrooms.

Precast marble and stone are most frequently used but some types are also available in enameled pressed iron and stainless steel. Eight to ten users can be accommodated at a 54-inch circular fountain and 5 to 6 at a 36-inch unit.

Showers are needed in many industries, particularly where operations are hot, dusty or dirty, or where toxic materials are used. Standards, depending on the health hazards of the plant range from one shower for every five men to one for every 50 men.

Showers may be of the compartment or the circular multi-stall type. Equipment should be thoroughly scrubbed daily and a disinfectant is recommended to destroy fungus organisms.

Floors and approaches should be of non-slip material, such as concrete with an abrasive surface. A curb 4 inches high should be erected around the shower stalls to keep water within the enclosure.

The curb should be painted a contrasting color to increase visibility and reduce the slipping hazard.

Sandals or slippers, wooden soled or made of paper or plastic, help to protect the feet against fungi.

Quick-acting showers at convenient locations for emergency use should be installed where acids and caustics or other corrosive chemicals are handled.

Skin cleansers may be classified into soaps, sulfonated oils, and synthetic detergents.

Powdered soaps are more economical than hard soap in individual cakes. These consist principally of powdered hard soap, a ground scrubber, and a water softener. The corn meal scrubber may be ground coarse or fine. Most of these soaps can be used with hard water.

Liquid soaps are widely used and generally satisfactory where a scrubber is not desired.

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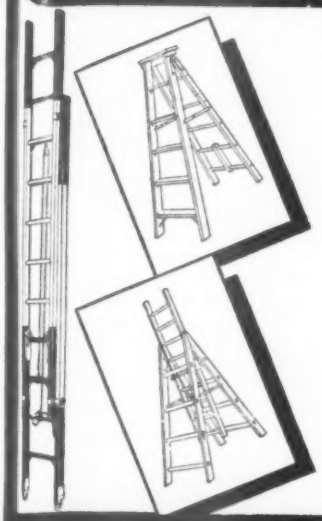

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Antiseptic soaps, some with deodorant qualities, are believed to have some value in preventing skin ailments among workers exposed to cutting oils, petroleum oils and heavy coal tar distillates.

Sulfonated oils are useful for dry and soap sensitive skins and for those exposed to defatting action of petroleum oils and solvents. They do not lather as well as soaps.

Synthetic detergents are of several types, with qualities which make them useful for various occupations. They are useful for removing oily, waxy and tar films.

In choosing skin cleansers, the industrial physician or safety director should know how to select the cleanser which is least harmful to the skin but efficient in removing soil. It is sometimes necessary to use different cleansers in various parts of the plant, or to use different cleansers on different types of skin to remove the same soil.

Use of naphtha, turpentine, carbon tetrachloride, and other solvents should be discouraged. These have a defatting action on the skin. Some are toxic and some are highly flammable.

Drying the skin. Common towels are now almost universally prohibited. Individual towels kept in lockers may not be changed often enough and they may come in contact with soiled work clothes.

Towel services are used by some establishments, usually stores and offices.

—*To page 57*

NOW

Safe, Economical Disposal of Fluorescent Tubes

The disposal of burned out fluorescent tubes, with or without beryllium content, is hazardous—all fluorescent tubes contain a phosphor of varying toxicity. The new StaSafe Disposal Unit confines tube destruction to an enclosed housing under a constant flow of water. The dangerous poison is washed away, and the broken tube fragments are packaged in a disposable container.

Write for bulletin No. 261
which describes the Step-by-Step process.

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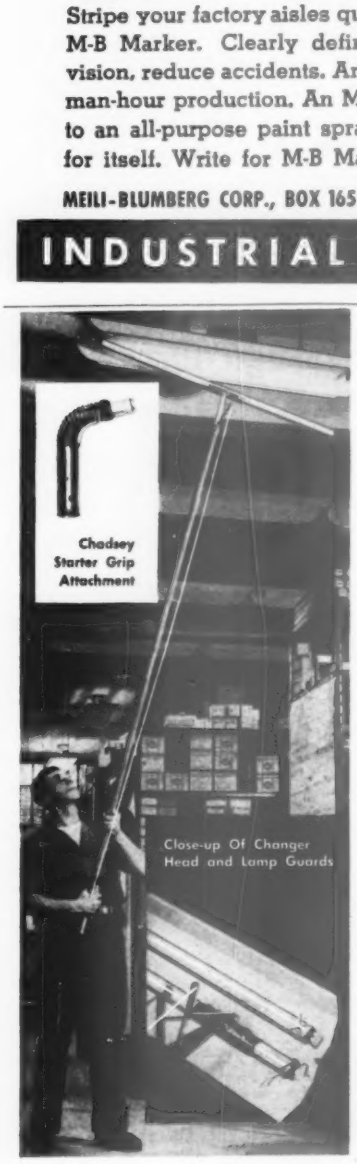

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Keep blinking fluorescent lamps and lamp outages at a minimum and lighting intensities up with

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A fluorescent lamp is only one part of a circuit and it should be replaced immediately on failure; for if it continues to blink, the other parts of the circuit, the starter and ballast, may be damaged.

Chadsey Fluorescent Lamp Changers are made for 40W, T-12 and 85W, T-17 lamps. Designed to snap onto Chadsey white-ash sectional poles.

The Chadsey Fluorescent Changer-Head is of sturdy metal construction. It operates through positive action by powerful spring actuated jaws with rubber grip lining. Jaws are opened by pulling cord . . . on release of cord, jaws grip lamp, "Like the Grip of Your Hand," lamp is then automatically removed or inserted. Works smoothly, easily and safely, eliminating the use of ladders and scaffolding.

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Sanitary Facilities

(From page 55)

Paper towels meet sanitary requirements and are economical and convenient. Dispensers should be kept filled and receptacles for used towels provided.

Recessed waste receptacles keep one more object off the floor, adding to the appearance of the washroom and making cleaning easier.

Electric driers are acceptable from the hygienic standpoint and simplify maintenance. These driers may be of the pedestal type or recessed into the wall. They are operated by foot pedal. Newer models are said to dry the skin in less time without increase in current consumption.

Toilets

Toilets should be partitioned off from washrooms and lockers. Partitions of enameled metal are attractive in appearance and easy to keep clean. These partitions may be suspended from the ceiling.

Wall mounted toilets make floor cleaning easier and quicker. The long, oval-rim type of toilet with open-front plastic seat is most widely used. Foot-operated flush valves are favored by many.

The flushing mechanism should be rugged since employees often kick the handle instead of operating it by hand. Flush valves should be equipped with vacuum breakers to avoid back siphonage.

Minimum number of toilets:

No. of persons	No. of toilets
1- 9	1
10- 24	2
25- 49	3
50-100	5
Over 100	1 for each additional 30 persons

Toilets should be not more than 200 feet from any workplace; preferably less than 150 feet.

Facilities for men and women should be plainly marked.

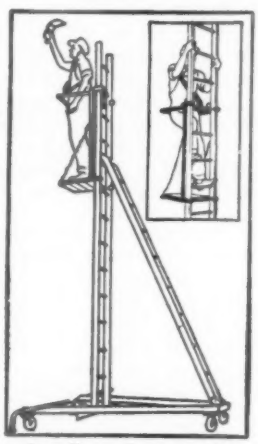
Urinals should be placed throughout the plant in convenient locations to avoid loss of time. One urinal for each 40 men is usually sufficient. Automatic flush valves use more water but are more effective in maintaining cleanliness since many persons seem reluctant to touch hand-operated valves.

Floors of toilet rooms should be of impervious materials, smooth and free from cracks. Tile and concrete are satisfactory. Floor drains permit frequent flushing.

If possible, toilet rooms should have outside windows for light and

—*To page 59*

Safety Elevator Scaffold and Ladder Truck



Built for easy handling, fast erection, stationary or mobile use. It provides high working range and convenient standing position close to the work. The high guard rail permits workman to use both hands and thus work safely and efficiently without strain. The scaffold can be erected or folded flat in two minutes. The elevator unit hooks on any of the ladder rungs and is supported from the workman's shoulder strap when moving up and down.

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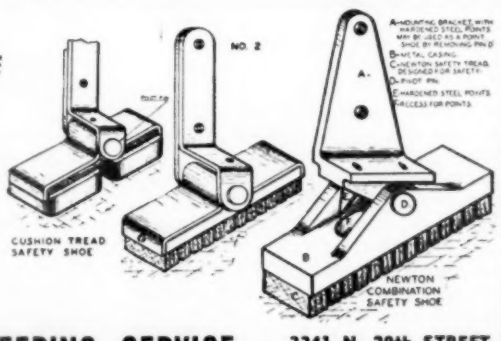

NEWTON ENGINEERING SERVICE
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Food Service

Fleet of "rolling cafeterias" supplying a large plant. Units are equipped with electric heating and refrigerating equipment. Disposable eating utensils are used. (Boeing Airplane Company).

FOOD service in the plant for industrial workers has become a factor in good industrial relations and an aid to efficient production.

Most concerns providing hot food in cafeterias or lunchrooms, or snacks from mobile units or canteens, expect no profit from such operations and are satisfied if they break even. Some that operate at a deficit consider the cost an investment in good will and efficiency.

Many of them started during the war when public eating places caused many workers to spend lunch hour standing in line. Now, in-plant feeding facilities appear to be permanent fixtures.

Types of Service. Industrial food service facilities are grouped generally into four types, (1) cafeterias that prepare and serve a wide variety of hot foods; (2) canteens or lunchrooms where wrapped sandwiches and other packaged foods are dispensed; (3) mobile canteens that dispense hot or packaged foods along established routes throughout the plant, and (4) boxed lunch service.

The eating environment. An important consideration in any type of food service is the eating environment. Wherever possible, lunch time should provide a change of scene. Workers should be able to sit down amid clean and pleasant surroundings and eat in an atmosphere conducive to enjoyment and good digestion.

However small, the plant lunchroom should be clean and attractive. The larger plant cafeterias may be used for safety meetings and other gatherings of personnel for business or pleasure. In any case, they should be pleasant.

Where only limited quarters can be assigned for such use, a schedule of staggered lunch hours for different departments might accommodate the entire force.

Workers who bring their own lunches from home, and those who patronize the boxed lunch service, may eat in the locker rooms, if clean and well ventilated, or in work areas in some types of operation. In some plants, however, because of the processes involved, consumption of food in work areas is undesirable or even dangerous.

Refrigeration for the home-packed lunches is a convenience that costs little and is appreciated by employees. A large, grocery-type refrigerator will suffice for a large force of workers.

Sanitation. Wherever eating is done, in work areas, locker rooms or lunch rooms, constant vigilance is necessary to maintain clean, sanitary conditions. Facilities for the disposal of garbage, waste paper, bottles, etc., are a necessity.

Nutrition. One advantage of the employee cafeteria is the opportunity to help workers follow recommended diets. Without being arbitrary, the cafeteria management can offer daily specials that will attract notice and encourage workers to choose proper food.

Healthful diet, according to the nutrition experts, should include the "basic 7" foods:

1. Green and yellow vegetables, raw, cooked, frozen or canned.
2. Oranges, tomatoes, grapefruit, raw cabbage or salad greens.
3. Potatoes and other vegetables and fruit—raw, dried, cooked, frozen or canned.
4. Milk and milk products, fluid, evaporated, dried milk or cheese.
5. Meat, poultry, fish or eggs, or dried beans, peas, nuts, or peanut butter.
6. Bread, flour and cereals, natural whole grain or enriched or restored
7. Butter or fortified margarine.

Principal meals are offered, of course, in the middle of each shift, but many industrial leaders are convinced of the value of mid-morning and mid-afternoon snacks as a contribution to the stamina and efficiency.

Rest periods. Such snacks are made possible in some plants by leaves or "passes" of 10 or 15 minutes for each worker to go to the lunch room. In other plants, mobile snack bars are wheeled through working areas, giving each employee a chance to pause for refreshment. A few plants provide a free bottle of milk for each worker as a pick-up between meals.

Conveniently located canteens, coin-operated vending machines and counters provide handy snacks in many plants.

Vending machines which dispense beverages in paper cups avoid the problem of lost and broken bottles. A good location for these machines is near a drinking fountain.

Quality and variety of food and the type of service in plant cafeterias should be as good, if not better than comparable offerings on the outside. Although many such facilities are operated by concessionnaires, workers are aware that the service is intended for their benefit. If there is any slackening in service or quality they are sure to resent it.

Choice of location for the plant cafeteria should depend on such considerations as convenience for the largest number of patrons, efficiency of supply and operations, and a pleasant, relaxing atmosphere. Soundproofing to deaden the clatter of dishes and the babel of voices is desirable. Light and ventilation are important considerations.

The Kitchen. Strict cleanliness is highly important. Patrons who might get a glimpse of kitchen operations should be reassured by such a sight.

Dishes should be washed, if possible, by machines which can handle stronger detergents and hotter water than human hands can stand.

Arrangement will have a great deal to do with efficient operation of the cafeteria. Patrons who want only a bottle of milk or cup of coffee should not be forced to wait in line behind those waiting for a more elaborate meal.

Management. In some plants operation of the food service is under the direction of a health and safety committee of foremen and workers.

Vending machines furnishing beverages, sandwiches, candy bars, chewing gum, and the like, usually are operated with a coin that leaves a margin for profit. Frequently the profit goes to an employees' welfare or recreation fund.

Drinking Water

HEALTH and efficiency, as well as physical comfort, require an adequate supply of pure drinking water. It can be provided at a moderate cost in any industrial plant.

Drinking facilities should be conveniently located and made inviting. Workers will drink enough only if the water is clean, cool and palatable. The attractiveness of the dispensing fixtures is also important—particularly for women employees.

In providing for the needs of workers, the following should be considered:

1. Number of persons to be served.
2. Type of work. It is light or strenuous physically?
3. Temperature of workroom.
4. Purity of water.
5. Temperature of water.
6. Design of fixtures.
7. Location of outlets.

A minimum of one outlet for each 50 employees has been suggested. More will be needed if the temperature is high or the work involves physical exertion.

If outlets are too far apart workers will not drink enough water or they will spend too much time away from work. Within reasonable limits, however, a pause for a drink is a beneficial relaxation.

Pure water has become recognized as an important responsibility of every city, and health departments maintain a close watch over the water supply. But when the plant is located outside the city limits, and for temporary operations such as construction, public utility and oilfield work, the employer must supervise the water supply. It should be analyzed regularly.

If unapproved or "service" water is used for industrial processes or for fire protection, signs should be posted warning against its use for drinking.

Sterilization. Water of questionable purity can be made safe for drinking by chlorination, ultra-violet radiation or boiling.

Filtration is sometimes desirable to remove objectionable sediment but this will not kill harmful bacteria.

Temperature of water. For workers who perform heavy manual labor, from 50 to 55 degrees F. is recommended. For office workers, restaurant patrons and others who are less active, the temperature may be as low as 45 degrees.

Methods of Dispensing

Two approved methods of dispensing drinking water are: (1) Drinking fountains of approved design; (2) Paper cups provided at the outlet.

Drinking fountains with individual cooling units are more suitable for many types of industry than a central cooling system. Fountains of recent manufacture conform to the ASA Code. Important features are a diagonal jet, which does not permit water to fall back on the nozzle, and a guard to keep the user's lips away from it.

Many of the older installations in factories, offices, stores and public buildings do not conform to hygienic standards but some of them could be modernized at moderate cost.

Desirable accessories in drinking fountains are line strainers and pressure regulators. Glass fillers are also useful, particularly for office use.

Paper cups should be kept in dustproof containers and receptacles provided for used cups. The container must be kept filled or workers will salvage old cups.

A cuspidor or sand urn at the fountain will receive much discarded chewing gum, tobacco, etc., that might otherwise find its way into the fountain bowl.

Maintenance of drinking fountains must be watched or unsightly and unsanitary conditions will develop. A few employees will need reminding of the importance of habits of cleanliness, and education is easier when accompanied by a good housekeeping program.

Portable Containers. For many jobs remote from the city water mains, as in construction work, public utility maintenance, in mines and other isolated working places, an open water bucket is the principal means of supplying drinking water. Too often one cup or dipper serves the entire crew.

Portable coolers, with dispensers for paper cups, are particularly useful on temporary jobs where employees must work at a distance from the water pipes. The container should have a tight-fitting cover.

Salt tablets should be available in hot weather.

Portable drinking fountains provide another method. One model uses a pump similar to a bicycle pump to maintain pressure. A slight pressure on a valve releases a jet of water at an angle, as in approved permanent installations, and a guard prevents the workers' lips from coming in contact with the nozzle. Insulation keeps water cool for several hours.

Portable containers should be cleaned daily and sterilized frequently—at least once a week. This can be done by boiling the container in an open kettle or by chlorination.

Sanitary Facilities

(From page 57)

ventilation. State or municipal regulations usually contain provisions for ventilation.

Cuspidors should be provided where needed and cleaned at least daily. The disposable type requires less handling.

Lockers

A well-equipped locker room is a necessity in any modern plant. It is an aid to orderly habits and often to health.

In plants where there is exposure to toxic substances, extra precautions are needed to prevent dangerous materials from being carried away on clothing. Separate lockers prevent contact between street and work clothes. They should preferably be in separate rooms with shower stalls between them.

In such plants supervised washup periods and shower baths are important safeguards.

Lockers with slanting tops have obvious advantages. The tops cannot be used for storage, a practice which otherwise can be checked only by constant supervision. Dust is conspicuous.

Built-in lockers, which extend to the ceiling, provide no outer surfaces where dust can accumulate.

Lockers should be at least four inches off the floor to permit flushing the floor without wetting the contents of the lockers.

Forced ventilation can be supplied through perforations in the bottom or louvers in the doors. An exhaust system to draw air through slots in the lockers to the outside of the building is recommended.

Rest Rooms

A rest room should be provided in all establishments where 10 or more women are employed. Where there are fewer women and a separate room is not available, suitable space, properly screened, should be provided.

For 10 women, minimum space is 60 square feet, with at least 2 square feet for each additional woman employee. For less than 100 women at least one bed or couch should be provided; for 100 to 250 workers, 2 beds, and 1 bed for each additional 250 workers.

Plant Managers Report:

formula SBS-50 . . . new cleaner-sanitizer saves up to 50% of cleaning labor

CHEMICAL ACTION DOES THE WORK

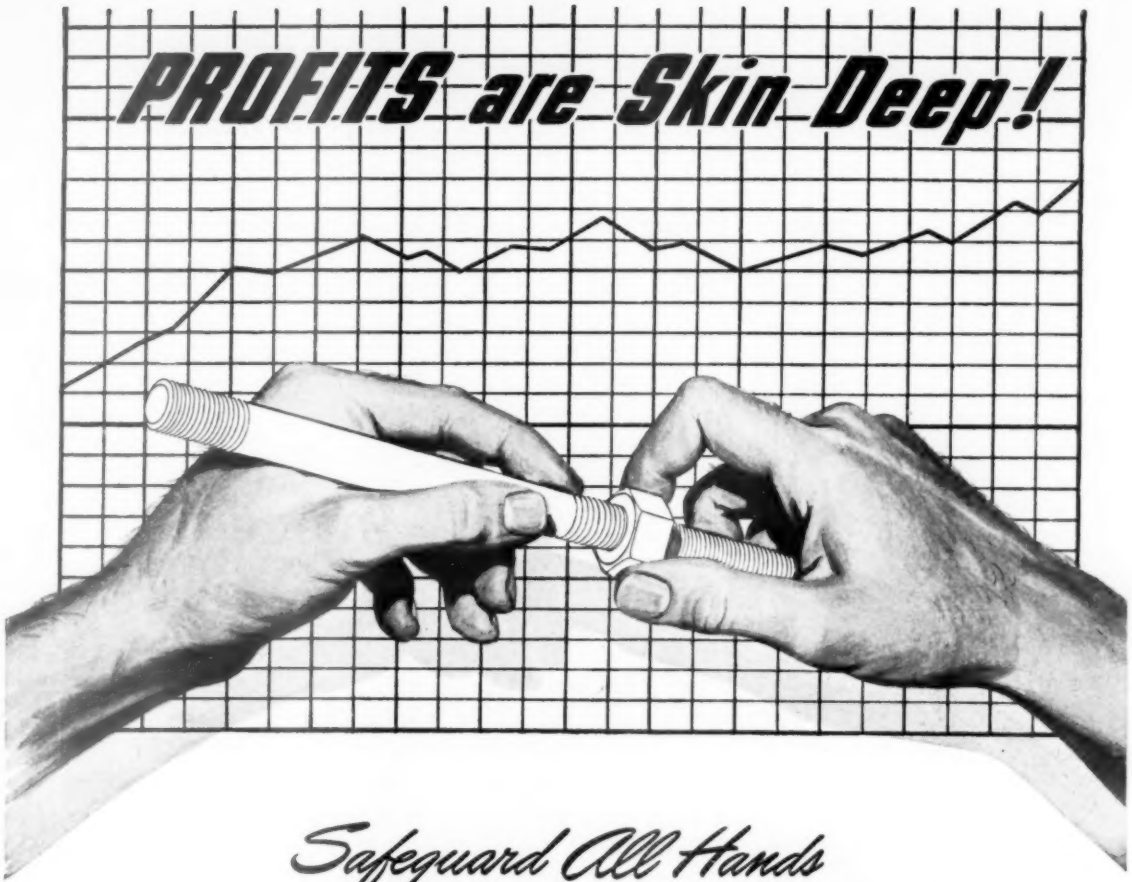
The new SBS-50 Cleaner-Sanitizer, recently developed in the laboratories of The Sugar Beet Products Co., eliminates the guess work and labor of mixing expensive disinfectants with detergents at your plant. SBS-50 SANITIZES AS IT CLEANS! No rinsing is necessary . . . no rubbing or scrubbing is required. SBS-50 is the answer to your cleaning-sanitizing problems for toilets, sinks, showers, wash room floors, cafeterias, etc. It is guaranteed to reduce bacterial counts of casual contaminants to safe levels as judged by public health requirements. Convince yourself of this 50% saving in cleaning labor by writing for a free sample of the new Formula SBS-50 Cleaner-Sanitizer.

FORMULA SBS-11 Heavy Duty Skin Cleanser is used today in more than 10,000 industrial plants. Even most stubborn grime and grease disappear quickly, safely under the soil-penetrating action of the new SBS-11. Contains no added alkalis, no harmful mineral abrasives. It protects your skin's "acid mantle," nature's own bacteria barrier. In 5-lb. boxes, 10 boxes per case.

TYPE R DISPENSER . . . the finest dispenser for real washroom efficiency. Heavy gauge steel shell and mounting bracket chromium plated with a high luster durable finish. Economical "circle" dispensing, adjustable to five different amounts of soap. Drip shield prevents clogging caused by splashing. All working parts easily removable, permitting complete servicing without removal from mounting. Quantity discounts available.

"The Washword of Industry"

SUGAR BEET PRODUCTS COMPANY • SAGINAW, MICHIGAN



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A quick-acting, thorough cleaner—LAN-O-KLEEN contains no harsh ingredients or excessive alkali. Prepared of a fine cornmeal base, it effectively removes deep-rooted grit, soil and grime—yet it's *gentler* on sensitive skins. Nor is that all! LAN-O-KLEEN is *superfatted* with a *higher percentage* of soothing, beneficial *lanolin* than are *ordinary* super-fatted soaps. Impregnated into LAN-O-KLEEN by an exclusive process, this lanolin has been proved to have a retarding effect upon the defatting action of soap. As a result, the skin gets added protection against natural oil-losses.

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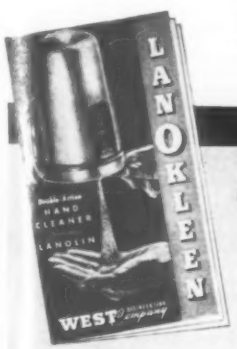

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42-16 West Street,
Long Island City 1, N. Y.

WEST DISINFECTING COMPANY 12
42-16 West Street, Long Island City 1, N. Y.

Gentlemen:
Please send me a free sample carton of LAN-O-KLEEN.

Name_____ Position_____
Company_____
Address_____
City_____ State_____

Place of Honor

TARA BROOCH
7th-8th Century A.D.
National Museum of Dublin

THIS magnificent brooch, "most famous of all Gaelic antiquities, is unanimously pronounced by goldsmiths and connoisseurs as . . . the finest piece of jewelry ever produced in any country."[1] Exquisitely fashioned of white bronze, its execution represents almost every process known to ancient goldsmiths . . . "and reflects that spirit which has created every masterpiece of art the world over."[1]

To strive for perfection in every detail, whether the result shall be visible or not, is the ideal of the true craftsman. To attain the highest skill, whether in the arts, science or industry, is the essence of indisputable leadership.

Such is the principle behind the constant effort of Pax for a full quarter century to make Pax Heavy Duty the finest of all industrial skin cleansers. Today, its preference among industry and workers is a testament to faultless quality, matchless cleansing efficiency, unsurpassed safety and notable economy.

[1]Ring Brooches of Medieval Ireland, by Eileen Buckley

PAX-LANO-SAV HEAVY DUTY
GRANULATED SKIN CLEANSER

PAX®

PAX-LANO-SAV*—a superior skin emollient combining lanolin and other special skin normalizers.

The Pax trademark symbolizes a deep-rooted tradition of superlative quality maintained through a quarter century of continuous research and development.

ADVERTISED IN AMERICAN MEDICAL ASSOCIATION PUBLICATION

G. H. PACKWOOD MANUFACTURING CO. • 1545-55 TOWER GROVE AVE. • ST. LOUIS 10, MO.

Manufacturers of Fine Industrial Skin Cleansers

*Tradename of G. H. Packwood Mfg. Co.

In addition to PAX-LANO-SAV HEAVY DUTY, PAX also offers the following powdered or granulated quality skin cleansers: PAX CORN-TEX • PAX HYSPEED • DICTATOR SPECIAL PURPOSE • BORAPAX • SUPER-X • VELVAPAX LIGHT DUTY • OFFICE-PAX • PAX MECHANICS. Also available are PAX WATERLESS and PAX HECTO INK CLEANSING CREAM • PAX SKIN CLEANSER ECONOMIZER DISPENSERS • and many other fine PAX Products.

50-

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Between zero and 10 decibels is the threshold of audibility.

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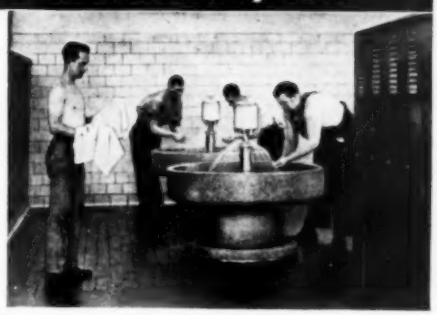
1710 Main St. Peoria, Illinois

The Most Sanitary Washing Facilities Provide Extra Economies, Too



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Bradleys have become the standard washing fixtures during the last 30 years. At the 54-inch Washfountain, 8 to 10 can wash, each provided with clean spray of running water. Foot-control and self-flushing bowl add to convenience and sanitation.

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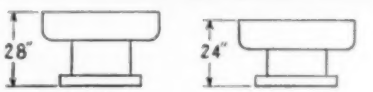

Standard Height 28" For Juveniles Height 24"

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Water use reduced 70%. Only a bit more water is required for a group at a Bradley than for conventional "single-person" basin.
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And Does—for your smaller washrooms

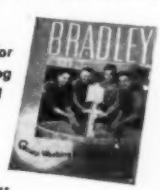
Foot-control, no faucets to touch or repair, no water waste—the maximum in sanitation.

When considering new, enlarged or remodeled washrooms—we can give you practical helpful suggestions. BRADLEY WASHFOUNTAIN CO., 2237 W. Michigan Street, Milwaukee 1, Wisconsin.

BRADLEY Washfountains

Sold Through Plumbing Wholesalers

Write for Catalog 4701



GIVES YOU CLEANER, MORE SANITARY WASHROOMS

Compare present day towel costs with modern Sani-Dri electric hand dryers. You'll discover amazing savings over towels . . . and the time and trouble of servicing empty towel cabinets and waste containers is eliminated completely! New, faster-drying Sani-Dri provides *automatic* 24-hour hand or face drying service with a stream of hot air . . . the most sanitary method known! New heating element and faster-flow nozzle drys hands or face faster than ever before!

SAVES 85% OF WASHROOM COSTS

Sani-Dri quickly pays for itself out of savings! No buying or stocking of towels. No unsanitary litter to clean up . . . no paper-clogged pipes . . . no fire hazard . . . no servicing of towel cabinets. Sani-Dri has carried the Underwriter's Seal of Approval for 18 years. It is the *only electric dryer* that has proven its dependability in over 22 years' use!

Distributors in Principal Cities

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NORTH CHICAGO, ILLINOIS

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North Chicago, Illinois

GENTLEMEN: Please send literature on the following

☐ Brochure 1082 on new, faster-drying Sani-Dri Electric Hand and Face Dryer

NAME_____

ADDRESS_____

CITY_____ STATE_____

Halsey Taylor

It's the line... for '50

in coolers and fountains

In every plant workers need the refreshing stimulation of a constant supply of cool water. And in every instant Halsey Taylor Coolers help provide abundant water and vital protection against contamination too! Cooler and fountain combinations or separate coolers for use with fountains strategically placed in office or shop. *Ask for literature.*

The Halsey W. Taylor Co.
Warren, O.

F-1

Mione Hand Cleaners are popular with workers because they get dirty hands clean *quickly*, *easily* and *safely*. And their economy is popular with management—a little Mione goes a long way.

There are 4 different Mione Hand Cleaners in powdered form—a grade for *very dirty hands*, another for office and home use, and intermediate grades for in-between wash-ups. All contain Coconut Oil and Lanolin; all are effective in either hot or cold water; all lather profusely and are pleasantly perfumed.

For those who prefer liquid soap, there is Mione Liquid Hand Soap. Made from double distilled Coconut Oil Soap with the glycerine retained, Mione Liquid contains Lanolin.

For happier hands at wash-up time, supply YOUR workers with the type of Mione best suited to their needs. Your supplier of washroom needs can give you full particulars about Mione, plus samples. If not, for any reason, write direct to us.

MIONE MANUFACTURING CO.

Makers of famous hand soaps for 36 years

COLLINGDALE PENNSYLVANIA

Listen! LET YOUR WORKERS TELL YOU WHY BANISHING *"Factory Hands"* LIFTS MORALE

THIS pH6 CLEANSER SURE TAKES THE STING OUT OF WASHING UP!
IT SURE DOES! MY HANDS HAVEN'T LOOKED AND FELT THIS GOOD SINCE I STARTED WORKING HERE.

Watch for other STEPAN products now past the laboratory stage and under practical application tests. Will be released soon.

ACCEPTED FOR ADVERTISING IN PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION

Workers who have used pH6 Skin Cleanser are usually eager to tell you how good it is . . . about the way pH6 helps them get rid of "Factory Hands" . . . the raw, red, defatted skin condition which causes discomfort, and even loss of manual dexterity.

pH6 is an excellent preventive measure against the complications resulting from unhealthy skin conditions. Workers like pH6 because it helps them clean up fast . . . gently yet speedily removes many types of industrial grime which stubbornly resist even harsh cleansers.

With its multiple advantages pH6, a sulfated oil of dermatological quality, costs no more than good grades of industrial powdered soaps. Convenient, economical dispensing methods are available to fit all types of wash-room equipment. Send today for free samples and complete technical data.

For FREE SAMPLES and complete technical data write to
THE STEPAN CHEMICAL CO.
1353 N. North Branch St.
Dept. NS3
Chicago 22, Ill.

pH6 REPRESENTATIVES

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2608 Olive St., St. Louis 3, Mo.
JUSTIN E. WILSON CO.,
P. O. Box 4082, Baton Rouge, La.
GENERAL EQUIPMENT CORP.,
261 Franklin St., Boston 10, Mass.
THE WATSON CO.,
1443 Main St., Buffalo 8, N. Y.
SAFETY FIRST SUPPLY CO.,
5005 Euclid Ave., Cleveland, Ohio
SECO SAFETY PRODUCTS CO.,
1437 Brooklyn Ave., Detroit 26, Mich.
GUARDIAN SAFETY EQUIP. CO.,
491 Prospect St., East Orange, N. J.
GUARDIAN SAFETY EQUIP. CO.,
747 M & M Bdg., Houston, Texas
KOPPELMYER SAFETY CO.,
6237 North Park Ave., Indianapolis 5, Ind.
BELLOWS & CO.,
Howells Ridge Rd., Knoxville, Tenn.
GUARDIAN SAFETY EQUIP. CO.,
6101 S. Main St., Los Angeles, Calif.
W. H. POPPE,
4920 Harriet Ave., Minneapolis, Minn.
SANITATION SUPPLY CO.,
731 Lincoln Ave., Peoria, Ill.
GUARDIAN SAFETY EQUIP. CO.,
4606 Walnut St., Philadelphia 39, Pa.
SAFETY FIRST SUPPLY CO.,
530 Fernando St., Pittsburgh, Pa.
ROCHESTER SAFETY EQUIP. CO.,
83 Howell St., Rochester, N. Y.
SAFETY & SUPPLY CO.,
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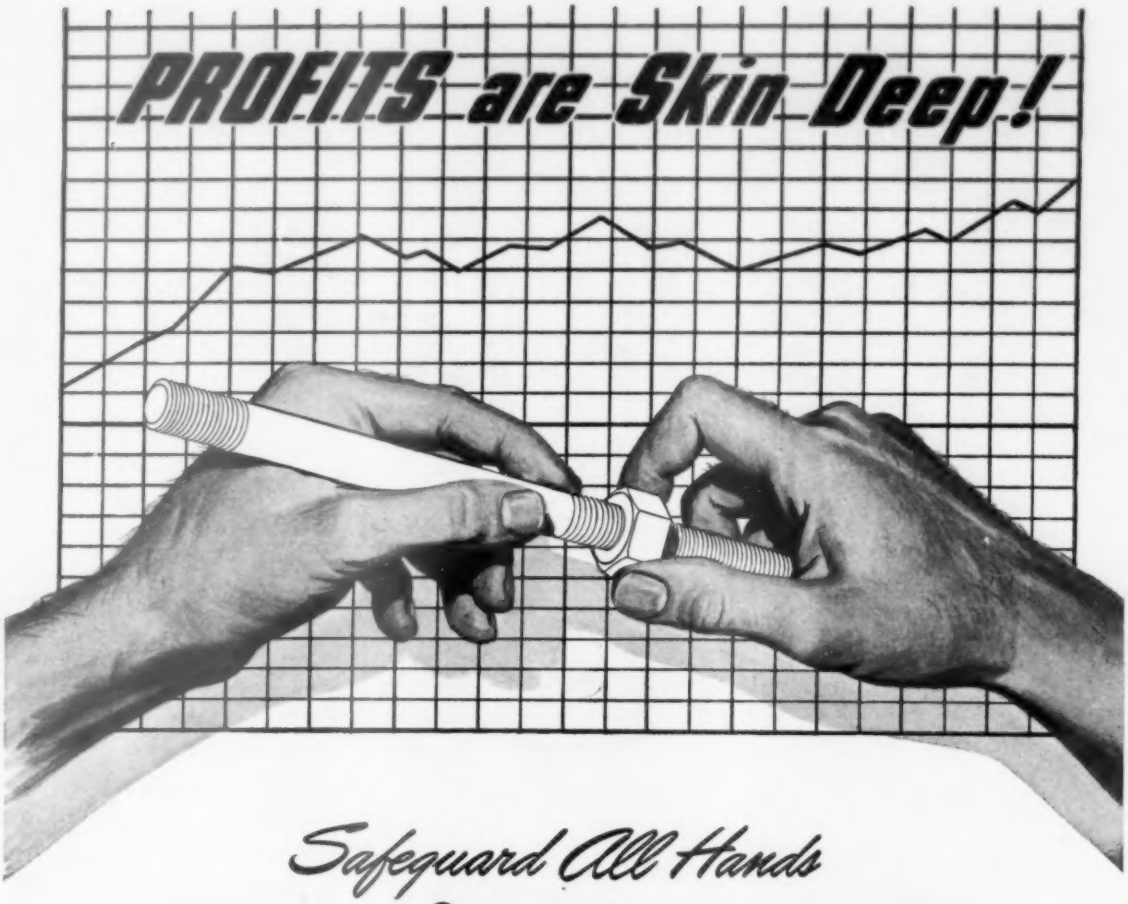

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Name_____ Position_____
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City_____ State_____

Place of Honor

TARA BROOCH
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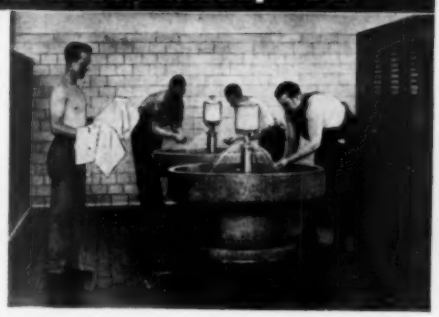

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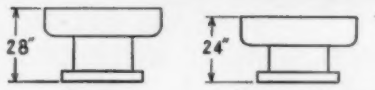

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NAME_____

ADDRESS_____

CITY_____ STATE_____

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Warren, O.

F-1

Mione Hand Cleaners are popular with workers because they get dirty hands clean *quickly, easily* and *safely*. And their economy is popular with management—a little Mione goes a long way.

There are 4 different Mione Hand Cleaners in powdered form—a grade for *very dirty hands*, another for office and home use, and intermediate grades for in-between wash-ups. All contain Coconut Oil and Lanolin; all are effective in either hot or cold water; all lather profusely and are pleasantly perfumed.

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With its multiple advantages pH6, a sulfated oil of dermatological quality, costs no more than good grades of industrial powdered soaps. Convenient, economical dispensing methods are available to fit all types of wash-room equipment. Send today for free samples and complete technical data.

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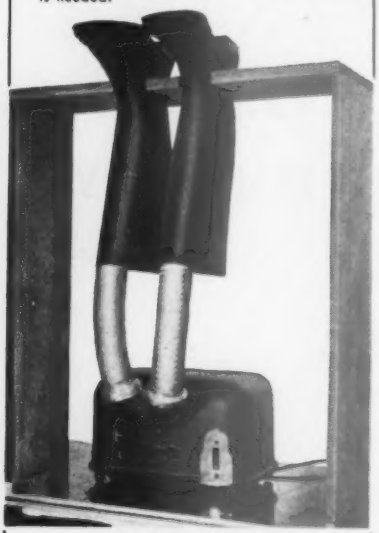
For Drying Small Equipment
Quickly dries all equipment small enough to be placed under the nozzle. Produces 95 cubic feet of air per minute, heated to a nozzle temperature of 168° F. Small, light weight and portable. Can be moved anywhere where a quick and thorough dry is needed.



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Rodent and Insect Control

Rats, mice and insects act as carriers for many contagious diseases, and their annual toll of destruction and spoilage runs into many millions of dollars.

Rat-proof construction will help to keep rodents out of buildings, but control measures should be extended over a wide area, to rout them from their ground burrows and hiding places under lumber, scrap or trash piles.

Temporary control consists of removing the existing rat population, by means of traps, gases or poisons, or by the use of their natural enemies, such as ferrets and certain types of dogs. This step is advisable, before permanent measures are taken, to prevent their migration to other premises.

Permanent control must be based on the fact they cannot exist without food, water and shelter. This makes good housekeeping vital, inside buildings and in the yard as well. Spilled grain must be swept up daily. Food scraps from employees' lunches should be placed in covered metal containers.

Calcium cyanide, applied to rat burrows with a foot pump duster, is a popular poison. Carbon monoxide

The commonsense way to
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Important: Did you note the "Radical reversal of medical teaching" in TIME Magazine? A report based on 10 years observation by 91 U. S. Skin Specialists calls Foot Baths "Futile"—"Illogical"—"Potentially harmful." Onox on the other hand is a safe, non-poisonous skin toughener. IT STEPS UP RESISTANCE . . . INSTEAD OF BREAKING IT DOWN! Try the Onox way. You'll be surprised!
(Copy of TIME article sent on request.)

from a gasoline engine exhaust, chloropicrin and methyl bromide also are effective. Manufacturers furnish directions for using the various rodent killers.

Lethal fumigant gases may be applied only by licensed exterminators. Many fumigants are also available in eradicating weevils, moths, beetles and other insects. Carbon disulphide has been used effectively in controlling weevils in grain.

Red squill is one of the most popular rat killers. It acts only as an emetic on other animals, but rats cannot vomit and death is certain. Its slow action permits the rodents to crawl off in their burrows to die without the nuisance of removal. Quick-acting poisons are apt to kill in every conceivable place, contaminating and causing offensive odors that may be hard to remove.

Barium carbonate, phosphorus or arsenic compounds, thallium sulphate, ANTU and sodium fluoroacetate also are widely used. The latter two should not be used around food, because of possible contamination, and there are no effective antidotes.

Directions for use of all poisons should be followed carefully.

Insecticides are available in liquid, powder and paste forms. DDT sprays are effective against many insects and may be applied by hand or power sprayers. DDT is relatively non-toxic to humans, but users should avoid inhaling the spray or getting it on the skin.

Planning

(From page 12)

A vertical clearance of at least 7 feet should be provided, especially over aisles, passageways and stairways. Where this is not practicable, overhead obstructions should be marked by contrasting paint or padded to reduce possibility of injury. Storage space must be adequate. Otherwise there will be confusion, bad housekeeping, fire hazards, overloaded floors, and damage to stock.

At unloading platforms ample space is needed for handling and storage of incoming materials.

Supplies, tools, safety equipment, small parts, and equipment not used frequently are often neglected in allotting storage space. This makes maintenance difficult, particularly with such items as personal protective equipment, portable ladders, and hoisting equipment.

Hazardous materials. Some materials have characteristics which require special precautions in storage. These include solvents, paints, oils, explosives, compressed gas containers, and corrosives. Storage of such materials is covered by existing codes.

Safe access to all parts of the plant should be provided. Stairways, rather than portable or fixed ladders, should be provided.

Stairs for general use should be convenient to the areas to be served. They should be equipped with standard handrails and unobstructed at top and bottom.

Machine Layout

Machines should be located so that each operator will have enough space to handle the material without interference from other workmen or from machines. It should not be necessary for him to stand in or near aisles where he will be menaced by traffic or interfere with it.

Movement of both persons and materials should fit smoothly into the general scheme of traffic.

In continuous line operation, where machines are frequently served by conveyors, little or no intermediate storage space for materials is necessary. In other types of operation added space for storage of raw and finished materials is essential.

Transportation

Materials flow. Transportation and material-handling equipment includes plant railways (standard and narrow gauge), motor vehicles, power trucks and tractors, hand trucks, cranes, conveyors, and elevators.

Studies should be made of the flow of materials through the plant, from the time they are received until they are shipped as finished products. Such

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studies will often reveal ways to eliminate unnecessary handling as well as safer methods.

Adequate clearances between transportation equipment and fixed structures and objects must be provided. This is particularly true in laying out plant railways and driveways.

In-Plant Transportation. Planning for the movement of power trucks and tractors, hand trucks and tractors in and about buildings requires provision for adequate clearance in aisles, corridors, passageways, and at corners and curves.

Aisleways should be wide enough to permit trucks to pass one another without crowding and without endangering persons working at machines.

Sufficient width should be maintained for free movement of fire apparatus. For one-way traffic, aisles should be not less than two feet wider than the widest vehicle loaded. For two-way traffic, aisles should be not less than three feet wider than twice the width of the widest vehicle loaded.

Clearance must also be provided for overhead cranes and conveyors. At least 24 inches of clearance should be allowed the highest points of cranes and overhead trestles and other overhead fixtures. Also, 24-inch clearance should be allowed between any part of the crane and wall, column or other stationary structure.

Cross aisles should be avoided at top and bottoms of ramps and inclines. If possible, aisle and ramp should be in a straight line.

Ramps used for both truck and foot traffic should have an extra three-foot width reserved for pedestrians.

Pedestrian Traffic. Aisles should be proportionately wider to accommodate rush traffic flow to such points as time clocks, lunchrooms and exit gates. Some companies provide main aisles up to 20 feet wide and cross aisles not less than 8 feet wide.

Where foot traffic parallels railways or other fixed-track carriers, adequate clearance should be provided to allow the aisle edge to be marked by a distinctive line on the floor. Aisles should always be clearly marked, by painted lines or otherwise.

Gates, warning signals or signs, and barricades should be provided. Where volume of traffic is heavy, underpasses and overpasses for both vehicular and pedestrian traffic should be considered.

Separate entrances and exits should be provided for pedestrians, vehicular traffic and railroad traffic. Entrance and exit gates should be not less than 35 feet from property line structures which may obscure vision. Gates for vehicular traffic should be so arranged that drivers will have a clear view of cross traffic when leaving the premises.

Let SIGHT SAVERS Supplement your EYE SAFETY PROGRAM

New **SIGHT SAVER** tissue dispenser contributes to

Safety Sight Saver tissues clean and polish eyeglasses quickly, easily and thoroughly . . . wipe away the best excuse men give for not wearing safety glasses. It doesn't make sense to ask a man to work with dull tools — or with dirty safety glasses.

Efficiency Employees, especially skilled craftsmen, work more safely, more rapidly, more accurately and with less eye strain if their glasses are Sight Saver clean.

A Safety Feature That Pays for Itself . . . many times over — by reducing the time required to keep glasses clean — by making safety glasses more comfortable to wear — by increasing accuracy and decreasing eye fatigue.

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All-metal Sight Saver dispenser can be installed in a few minutes . . . serviced by simply inserting refill packet about once a month. Fool-proof, permanently lubricated mechanism dispenses one 3" x 7" tissue at a time.

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FIRST IN SILICONES

DOW CORNING CORPORATION • MIDLAND, MICHIGAN

"Calling All Hands" FOR PREVENTO Protection!

Chemical irritants in cutting oils are an ever-present threat to sensitive hands. To help eliminate the hazard of skin irritations which may lead to dermatitis, hands need a protective coating—applied *before* working periods so that it affords full protection between hand washings.

PREVENTO provides such a coating. Different types are available for different cutting preparations and shop conditions.

PREVENTO is convenient to use . . . spreads quickly . . . gives hours of dependable protection . . . has a refreshing odor . . . vanishes upon washing. *Here's low-cost insurance against slowdowns and lost working hours resulting from painful skin irritations.*

Write for folder "How Long Can They Take It?" and see your DOLGE SERVICE MAN for our cutting oils analysis service.

PREVENTO

THE C. B. DOLGE CO.
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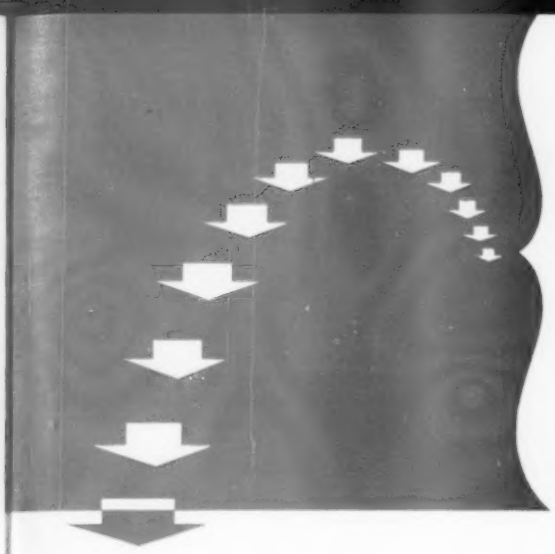

PERSONAL PROTECTION

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Much essential work must be carried on in environments dangerous to life and health. Under such conditions and in the dramatic emergencies of fire and explosions, personal protective equipment plays a life-saving role. Laboratory research and experience on the job have resulted in development of equipment that offers greater protection and comfort.

Eye Conservation

INDUSTRIAL operations expose the eyes of workers to a variety of hazards, including, flying objects, splashes of corrosive liquids and molten metals, dusts, and harmful rays.

Injuries to the eyes result in a high degree of disability and often facial disfigurement. The cost per injury from the standpoint of medical treatment and compensation is high, and the total cost to employers and employees is heavy.

Some eye hazards can be controlled at the source by means of enclosed processes and shields on equipment. Many eye injuries, however, occur in occupations not considered eye hazardous and from circumstances not foreseeable. For this reason, some companies have introduced eye protection for all employees and have reported substantial savings through eyes saved. Few accident prevention programs have produced such measurable results as eye protection.

General types of protective equipment for eyes and face include:

Goggles (safety glasses)
Face shields
Welding masks and helmets
Acid hoods

These devices are available in many types for practically every occupation. The protective medium may be heat-treated glass, transparent plastic, wire screen, laminated glass, or light-filtering glass.

A complete program of eye conservation includes not only protection against injury but also correction of visual defects which reduce the individual's efficiency and his liability to accident.

Visual surveys. For pre-employment examinations and periodic re-examinations there are devices which indicate the visual status of the individual. Manufacturers of this apparatus have prepared systems which use the data obtained from the tests in determining the fitness of the employee for various occupations.

These tests may be given by trained laymen. Their purpose is to detect visual defects, not to prescribe for them. Those needing corrective lenses are referred to refractionists (ophthalmologists or optometrists) to be fitted with glasses.

In prescribing corrective lenses, whether for safety goggles or ordinary spectacles, the refractionist should be familiar with the needs of the job. It is particularly important to know the distance of the working level from the eye.

Prescription goggles. For visual defects, the wearer may have the correction ground in heat-treated lenses, or cover goggles may be worn over spectacles.

For most cases corrective goggles are preferable for optical reasons as well as convenience. Most prescriptions can be ground in protective glass.

Cover goggles are often preferred where a near-sighted person requires deep minus lenses. These would be excessively thick at the edges and too thin for adequate protection at the center. Cover goggles also have advantages where the correction is complicated and the lenses would be subject to pitting on the job.

Familiar types of cover goggles are the cup type and the wide vision type with plastic lenses.

Types of Goggles

Heat-treated lenses fitted into spectacle frames or cup goggles offer basic protection. The nature of the particular job and the eye hazards involved determine the specifications in each case.

Spectacle goggles are recommended for light or moderately heavy work, such as grinding, machine work and assembling where working positions are not too close.

Side screens of metal or plastic provide protection against light objects flying from the side. They should be used where operations are close together, or where employees work together on the same operation.

The frame must be rigid enough to hold the lenses in proper position in front of the eyes. The nose bridge

Molten babbit exploded when being poured into a concrete hole but this plastic face shield saved the wearer's eyes, face and neck from injury. (Dravo Corp.)

TYPES OF PROTECTION RECOMMENDED	TYPES OF EXPOSURE				
	HEAVY IMPACT chipping, heavy machine work, etc.	MODERATE IMPACT machining, grinding, woodworking, etc.	SPLASHES chemicals, molten metal, etc.	DUST compressed air, sand, dust, etc.	GLARE treating, pouring, welding, heat, etc.
EYE CUPS		NO			
SIDE SHIELDS	NO		NO	NO	
SPECTACLES	NO		NO	NO	
EYE SHIELDS	NO			NO	
FACE SHIELDS	NO			NO	
HOODS	NO	NO			NO
HELMETS	NO	NO	NO		

should be adjustable, or goggles should be available in enough sizes to fit various faces.

Cup goggles are used for heavy grinding, machining, chipping, riveting, work with molten metals, and similar operations.

The cup should be wide enough to protect the eye socket and distribute the impact from any blow over a wide area. The cup should be flameproof, corrosion resisting, and nonirritating to the skin.

Rubber mask-type goggles are made with lenses of heat-treated or untreated glass or plastic for protection against splashes of corrosive chemicals and exposure to fine dust. Some types may be worn over spectacles. The ventilated types are less troubled by fogging.

Dust goggles of the leather mask type are made with heat-treated, untreated or filter lenses. Wire screen ventilators around the eye cups provide ventilation.

Miners' goggles of non-corrosive wire screen are used for work underground and in other locations where fogging is a serious problem. The screen is coated a dull black to reduce reflection.

Ease of cleaning and sterilization should be kept in mind when goggle design is considered. Most goggles now on the market meet these requirements.

Goggles should be fitted as close to the eyes as possible without touching the eyelashes to give the widest possible angle of vision.

Minimum permissible size for oval lenses is 48 mm. in the vertical dimension and 44.5 mm. in the horizontal. Round lenses should be 50 mm. in diameter.

Lenses should have no appreciable distortion or prism effect.

Strength of heat-treated lenses (resistance to impact) should conform to specifications of the Federal Standard Stock Catalog, the Government's official purchasing guide, Specification GGG-G-G-501B.

Plastic lenses have qualities of optical glass in light transmission and freedom from distortion. They are light in weight and do not fog as readily as glass. They are useful for spotwelding, as molten metal does not adhere to them as readily as to glass. They withstand considerable impact but are marred or scratched more easily than glass.

Harmful Rays

Research has developed glass effective in filtering out harmful ultraviolet and infrared rays present in welding and cutting, furnace and boiler observation and other operations where there are high temperatures and excessive glare.

Didymium glass is used for protection against bright yellow glare encountered in glass blowing and similar operations. It is also useful for some precision operations in laboratories.

Melters' goggles of cobalt blue glass come in spectacle and cup types in graded shades. Lenses with color in the upper half and clear glass in the lower half are also obtainable.

Sun glasses do not qualify as ray-filter glasses for most industrial exposures. They are designed for protection against discomfort caused by sun glare. The better glasses conform to optical standards but many of the cheaper ones show considerable distortion.

Welding helmets provide protection for the eyes and face under the severe conditions of arc welding. They are attached to headgears so they can be raised for placing the work. Impact goggles worn under the helmet provide protection when the helmet is raised. Helmets are made of dielectric fiber resistant to sparks, molten metal and flying particles, and a poor conductor of heat. Easily replaceable cover glass protects filter plate.

Some helmets have a lift-front glass holder which permits rapid inspection of work without removing helmet.

Welding hand shields are used on operations where a helmet is not practical, and on tack welding, set-up work, inspection and time study work. Construction is similar to welding helmets.

Shade Numbers of Filter Lenses
(National Bureau of Standards Handbook H24)

No. 3—For protection against glare or reflected light, spot welding operations, light brazing.

No. 4 or No. 5—Light acetylene cutting and burning.

No. 6—General acetylene welding, or welder's helper or set up on arc welding.

No. 8—Heavy acetylene welding or cutting, or very light arc welding.

No. 10—Arc welding up to 250 amperes.

No. 12—Arc welding of more than 250 amperes, atomic hydrogen welding.

No. 14—Carbon arc welding.

Goggles are available in shades up to No. 8; higher numbers in helmets.

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Respiratory Protection

RESPIRATORY equipment has been designed to protect the worker against a wide variety of air contaminants. These range from relatively harmless but irritating substances to toxic dusts, vapors, mists and gases.

Wherever possible, air contaminants should be removed at the source by ventilation. Enclosed processes also prevent air contamination. However, leaks and breakdowns may occur and there are some operations where the exposure is brief or infrequent. For such contingencies personal respiratory protection is often needed.

The worker's air intake may be safeguarded by three principal methods: (1) Mechanical filters to remove dusts and mists, (2) Absorption or chemical reaction to remove gases and vapors, (3) Supplied air.

Types: The four general types of repiratory equipment are:

1. Canister gas masks and chemical cartridge type respirators.
2. Filter respirators.
3. Supplied air equipment.
4. Self-contained apparatus supplying oxygen or air.

Each type of equipment has a definite field of usefulness, and equally definite limitations. Manufacturers and dealers, therefore, want to know the type of exposure when equipment is ordered.

Approval. Equipment which meets accepted standards carries the approval label of the U. S. Bureau of Mines. Approval covers not only design and construction but also the types of exposure for which it is approved.

Gas Masks and Cartridge Respirators

For solvent vapors and injurious gases a gas mask or cartridge type chemical filter type respirator is used.

These are essentially the same except that the canister of the gas mask is considerably larger, contains more absorbent, and is effective against higher concentrations and for longer periods that the chemical cartridge respirator.

Cartridge type respirators should be used only where the concentration of injurious material is low.

Canisters of gas masks are painted with identifying colors as follows:

1. Black—Organic vapors.
2. White—Acid gases
3. Yellow—Organic vapors and acid gases.
4. Green—Ammonia.
5. Brown—Organic vapors, acid gases and ammonia.
6. Red—All industrial gases, including carbon monoxide, smoke and fumes.
7. White with green stripes—Hydrocyanic acid gas.
8. White with yellow stripes—Chlorine.
9. Blue—Carbon monoxide.

Canisters are approved by the U. S. Bureau of Mines for concentrations up to 2 per cent of most gases and vapors. If there is any doubt about the hazard or the gas mask being used, the manufacturer should be consulted.

Filter Respirators

Protection against any form of particulate matter can be provided by a mechanical filter respirator of proper design. Major items to be considered are resistance to breathing offered by the filter element, adaptation of face piece to faces of various shapes, and fineness of particles to be filtered out.

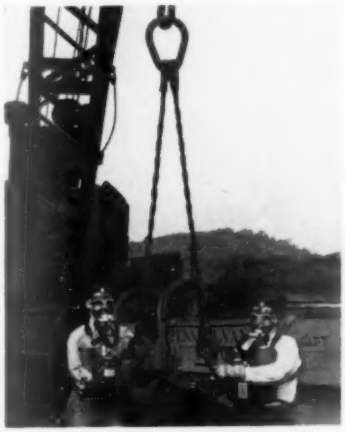
ASA Code Z-2 requires that the complete respirator show a resistance not in excess of 50 mm. of water to inhalation at a rate of 85 liters of air per minute. Resistance to exhalation under the same conditions may not exceed 25 mm. Commercial respirators are usually held to considerably lower resistances.

Specified types of filter respirators are approved for protection against inhalation of non-toxic or nuisance dusts. Other types are used for silica and other pneumoconiosis-producing dusts, and toxic dusts, vapors and mists.

Mechanical filter respirators offer no protection against solvent vapors, injurious gases, or oxygen deficiency.

Hose Masks

Atmospheres immediately hazardous to life require air supply from a point beyond the contaminated area. As a rule, *hose lines* (with at least a 1-inch connection) are recommended rather than *air lines* with connection to the compressed air system. The primary reason is that, in case of failure of air supply, it is possible to breathe through a considerable length of hose.



Crews of Pennsylvania Railroad's wreck trains are trained in the use of oxygen-breathing apparatus for emergency use. The apparatus generates its own oxygen and provided protection for 45 minutes. (Mine Safety Appliances Company).

Hose masks are not approved with more than 150 feet of hose or where inhalation resistance exceeds 2.5 inches of water, or the exhalation resistance exceeds 1 inch of water.

Attachments of additional hose should not exceed the total prescribed length and should be approved for use with that type of mask and should have approved couplings.

The hose mask should always be used for work which involves entering tanks or pits where there may be a dangerous concentration of dust, mist, vapor, or gas or oxygen deficiency.

Oxygen deficiency should be suspected in any iron or steel tank unless a test shows that it is safe. The rusting walls of an otherwise clean tank may deplete the oxygen supply dangerously. An irrespirable atmosphere should also be suspected in any tank which has held organic materials, such as grain or grain products, any type of oil, or any food material.

Upkeep consists of oiling and mechanical attention to the blowers, inspection and periodic replacement of the inhalation and exhalation valves, and regular cleaning of the rubber parts.

Adjustments should be in accordance with the manufacturer's directions. The blower is designed to furnish an excess of air sufficient to keep the face piece under a slight positive pressure, but in case of blower failure, air must be drawn through the hose by the inhalation and the face piece and exhalation valve must withstand the resulting negative pressure without leakage.

Harness to pull the hose lines requires inspection prior to use. The minimum requirement is that component parts of harness shall withstand a pull of at least 250 pounds.

No parts which are to be used subsequently should be tested by pulling, but should be examined for signs of wear or deterioration. Any condition which appreciably reduces the mechanical strength should indicate replacement.

Where hose masks are supplied as emergency and rescue equipment, frequent and thorough training in their use should be given to those who may use them.

Air-Line Respirators

An air-line respirator, for connection to compressed air-lines, provides essentially the same protection given by hose masks except for atmospheres so immediately hazardous to life that the wearer could not escape if a fail-

—To page 102

Foot Protection

THE safe efficient worker must be well shod. His footwear must be properly fitted and comfortable. It must protect his feet against moisture, hot substances, rough surfaces, puncture wounds, and falling objects. This protection is provided by many types of industrial shoes.

The effectiveness of safety shoes and foot guards in preventing foot injuries is proved by the experience of many companies, large and small.

Safety shoes, as the term is generally used, refers to shoes with reinforced toecaps. These are available in a variety of styles for both men and women.

Steel toecaps are favored because of their strength in resisting heavy blows. Fiber and plastic are used for shoes worn around electric equipment where strength is secondary to the need for insulation.

Standards for safety shoes were established on a temporary basis by the American Standards Association as American War Standards, Z41 series. Revision of these standards for permanent use is in process. In the meantime they are still a useful guide for purchasers.

Specifications call for a well-constructed, durable work shoe with the toe reinforced with a steel cap. This cap is supported upon a flange resting on the sole of the shoe. As installed, it must be capable of supporting a static load of 2500 pounds and of withstanding the impact of a 50-pound weight dropped one foot. The inside of the toe cap must come not closer than one-half inch from the upper surface of the sole under either of these tests.

Strength requirements for both women's and men's shoes are identical.

Shoes meeting these requirements can be recognized by the identification stamp which appears in one shoe of every pair. The stamp indicates the type of shoe according to the code classifications.

Types

Safety shoes are made in many types and styles, some suitable for street wear. The toecap does not add materially to the weight or the cost of the shoe. Well-made safety shoes can be as comfortable as other shoes of comparable weight.

Foundry shoes. An early type of safety shoe was the foundry shoe with elastic panels at the sides. There is no opening on the instep where molten metal or hot sand can penetrate and the shoe can be pulled off quickly in an emergency. This model is furnished with steel box toe.

General purpose shoe. The most widely used type is the blucher, high cut or oxford. It is available in a wide range of sizes, widths and lasts, ranging from rugged, heavy-duty styles to those suitable for street wear. It is the basic type, with certain differences in detail for special occupations.

Soles and heels of rubber with cord embedded offer considerable resistance to slipping on many surfaces. Another type has particles of cork embedded. Rubber soles deteriorate quickly when exposed to grease, oil, solvents and some acids.

Neoprene, which offers greater resistance to oils and solvents, is also made with anti-slip elements embedded.

No type of footwear, however, can be expected to prevent slipping where excessive quantities of grease and oil are allowed to accumulate on floors.

Hot surface shoes. Oak leather soles will not give satisfactory service where heat is excessive. Chrome-tanned leather resists heat better than most sole materials. Composition belting is another serviceable material.

Wood soles stand up under conditions which would quickly ruin leather or rubber. They are used in steel mills, foundries and other places where hot operations are carried on, also where there is dampness, oil, acids or caustics underfoot. They afford protection against nails, broken glass, scrap metal and other sharp objects.

Wooden soled shoes can be obtained with steel toe caps or with guards which cover toes and insteps.

Rubber footwear. Where work must be done in deep mud or in water, rubber boots contribute to health, comfort and safety. Rubber boots are available with steel box toes.

Foot guards and shin guards are available separately or in combination.

"Shoemobile" used for dispensing safety shoes at Hawthorne Works of Western Electric Company. This mobile unit takes shoes to employees who are unable to get to one of the company's four safety shoe stores.

Spark-proof shoes. Shoes with brass hooks and eyelets and brass nailed heels are worn in some industries where flammable materials are handled and flammable gases may accumulate.

Shock resisting shoes. Some are non-metallic with fiber box toes; others have steel box toes which are partially insulated. These shoes are designed for men who work around electric current. They are also worn by those handling combustible materials and by workers in explosives plants, and grain products refining companies.

Conductive shoes are designed to ground body static safely and prevent its building up on the body to the point where it could cause a spark.

The conductivity of these shoes is affected by other conditions. Wool, natural silk and nylon socks act as insulators to the body; cotton, lisle or rayon are satisfactory. Foot powder also serves as an insulator. The floor as well as the shoe must be a conductor.

Foot Guards

Where unusually heavy objects are handled, feet may need more protection than is provided by shoes with reinforced toes. For such work, foot guards of heavy gauge, flanged and corrugated metal are obtainable.

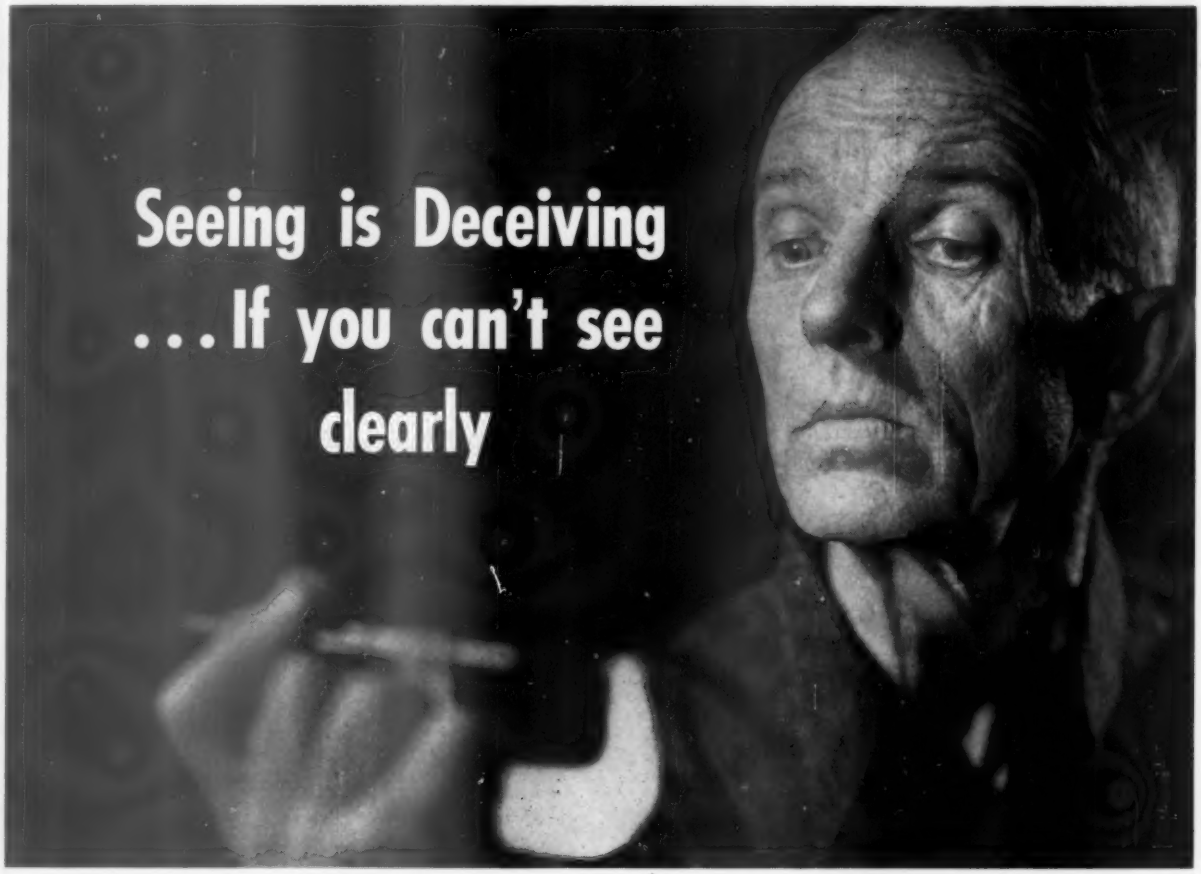
The guards are strapped on over the shoes and protect the instep as well as the toes.

With the flange resting on a firm floor surface, foot guards should stand an impact of at least 300 foot-pounds without being dented sufficiently to damage the shoe underneath or injure the foot.

Foot guards are also made with soles of rubber or calked steel to minimize slipping hazards.

Combination shin-foot guards, with an aluminum alloy shin protector hinged to the foot guard, are available.

—To page 112



EYE SAFETY is a TWO-IN-ONE program

Faulty vision not only hinders an employee's working efficiency, but it impairs his safety. In your plant no less than 50% of workers need eyesight correction if they are to see clearly—and safely. That's why every eye safety program should be built on the basis of *protection plus correction.* Industrial eyewear with correction lenses, professionally-prescribed, will improve your safety record and your production record. Call on your Bausch & Lomb distributor for prompt prescription service on industrial eyewear.

GREATER NEW YORK SAFETY CONFERENCE BOOTH 19

Write for a copy of the Bausch & Lomb catalog on industrial eyewear. It includes a highly informative discussion of the theory and design of protective industrial eyewear. It also describes the complete line of Bausch & Lomb Occupational Eyewear, the eyewear built to the highest quality standards in the industry. Bausch & Lomb Optical Co., 681-O St. Paul St., Rochester 2, N. Y.

BAUSCH & LOMB *Safety Eyewear*

Section 2—Personal Protection

Section 2—Personal Protection

WILLSON—the most complete line

for Eye and Respiratory Safety Equipment

Being able to get everything you need in the WILLSON line of eye and respiratory protection is only half the story. The other half is wearing comfort that has been designed into this broad range of products. You can supply workers with safety equipment—but getting it worn is the problem. Forestall worker resistance by selecting protective devices that are lightweight, correct size, anatomically shaped for proper fit. WILLSON passes the test of wearer comfort at no sacrifice of safety. Get in touch with our nearest distributor.

In addition, WILLSON provides safety program helps such as safety posters and pay envelope enclosures. And to help you make proper selection of WILLSON products, we have a completely new WILLSON catalog with many selection charts and tables that will help solve many safety problems.

Safety Spectacles

STYLE AVS HI-LINE*
Metal Frame with Sideshields

STYLE B—Metal frame saddle nose bridge

STYLE WK
Plastic Frame

STYLE WVIO
Metal Frame for wide vision

STYLE WP
Plastic Frame

Cup Goggles

STYLE RR50
Ventilated for heavy duty

STYLE L2—Nylon cups with wide vision

STYLE X41
Rubber mask for chemical splash

STYLE CC602—Cover-all*—wear over prescription glasses

STYLE DL48—For hot jobs

Plastic Protection

MONOGOGGLE*
Front and side protection
*®

FEATHERSPEC*
Lightest weight spectacle

PROTECTO-SHIELD*
Full face protection

WILLSON Dependable Products Since 1870

Respirators

STYLE 780—For metal fumes, mists, all dusts

STYLE 750D
For mists and all dusts

STYLE 701
For gases and vapors
(low concentration)

STYLE 5D AND 45D
For all dusts

STYLE 22
For nuisance dusts

Gas Masks

STYLE WIG
Emergency type gas mask

STYLE WHG—For industrial gases and vapors

STYLE WTG — For hydrogen-sulphide gas

STYLE WEG
Lightweight assembly

Welding Goggles

STYLE RW50
Standard—heavy duty

STYLE MW50—Easy-to-wear spectacles

STYLE L1
Nylon cups—wide vision

STYLE CW60
Cover-all type

STYLE DC53
Chip-weld type

Welding Helmets

STYLE 60S
One-piece shell with flip front

STYLE 130—Fabricated shell—stationary glass holder

STYLE 9
Chrome leather with flip front

ASBESTOS COVERING
for all WILLSON helmets

STYLE 8
One-piece hand-shield

WILLSON PRODUCTS, INC. • 205 Washington Street • Reading, Penna.

eye SAVERS MOLDED CURVED MODELS

Available in two sizes, with replaceable Impax® plastic lens. Fit over most styles of rimless and metal-frame glasses.

MODEL 7

crystal clear plastic frame

medium bridge size

Clear frame permits unimpeded vision in all directions, with full protection against injury from any angle. ALSO MODEL 27—Large bridge size.

MODEL 9

"blackout" plastic frame

medium bridge size

Opaque black frame eliminates glare from overhead lights or adjacent operations. Excellent for precision work. Recommended with green lenses Nos. 3 or 5 for welders' helpers. ALSO MODEL 29—Large bridge size. NOT DESIGNED FOR WELDERS.

MODEL 10

transparent green plastic frame

medium bridge size

Restful green tint eliminates eyestrain caused by sunlight and other harsh glare. Clear lens permits unimpeded wide-angle vision. ALSO MODEL 210—Large bridge size.

MODEL 10 G2

transparent green plastic frame

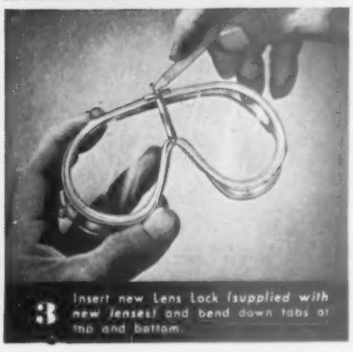
with green Impax® lens

Same as model 10 with optically clear green-tinted plastic lens. Restrains harmful ultra-violet and provides full eye protection for workers in open sunlight. Ideal, with 32 vents, for hot weather. Order with G3 green lens for work where sun is reflected from water. ALSO 210G2—Large bridge size.

How to replace lens in all curved models:

1 Straighten both tabs on metal Lens Lock.

2 Spread frame at bridge until old lens is disengaged from channels. Insert new lens.



3 Insert new Lens Lock (supplied with new lenses) and bend down tabs at top and bottom.

PAT. N. 2555.

WATCHEMOKET OPTICAL CO., INC. • PROVIDENCE, R. I.

How you make the Goggle fit the Job

Reduce eye protection Costs

with Tuc-Away eye SAVERS

Change-around Plan

RETRAX TEMPLE MODEL

Extra-strong Plexene* plastic frame has Retrax* adjustable metal temples that adjust for perfect fit.
Frame colors: light or dark.

CLUB TEMPLE MODEL

Extra-strong Plexene* plastic frame has plastic club temples for easy fit.
Frame colors: light or dark.

These methacrylate lenses are quickly interchangeable with either frame. Optically correct, shatterproof, in clear, light green, medium, and dark green, they rigidly lock in the deep strong frame channels which securely hold lenses so they can't be knocked in!

(Complete goggle weighs less than 1¼ ounces)

See your jobber today, or write . . .

WATCHEMOKET OPTICAL CO., INC.,
PROVIDENCE 3, RHODE ISLAND

In Canada: Levitt-Safety Limited, Toronto 12, Montreal 1
In South Africa: Keip Brothers, Johannesburg, South Africa
In Scandinavia: Uppsala Optiska Industri, Uppsala, Sweden

BT. M. REG.

SAVE WITH CHEEPEE

THE LOWEST COST

ONE-PIECE, CLOSE-FITTING, ACETATE, QUALITY GOGGLE

Lens surface unaffected by manufacturing process.

Fits over most glasses.
Exceeds Federal specifications for resistance to breakage, and optical quality.
Weighs less than 1 ounce.

In Clear and Green

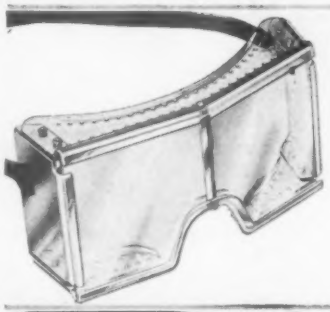
SEE YOUR eye SAVERS DEALER OR WRITE

WATCHEMOKET OPTICAL CO., INC.,
PROVIDENCE 3, RHODE ISLAND

In Canada: Levitt-Safety Limited, Toronto 12, Montreal 1
In South Africa: Keip Brothers, Johannesburg, South Africa
In Scandinavia: Uppsala Optiska Industri, Uppsala, Sweden

eye SAVERS MOLDED SQUARE MODELS

Available in regular and extra large sizes, with replaceable Impax* plastic lenses. Fit over most metal frame, zyl frame and rimless glasses.



MODEL 1-N

crystal clear plastic frame

medium bridge size only

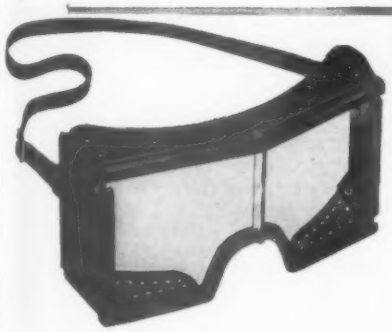
Clear frame gives complete protection, with unimpeded vision. New ALL-MOLDED construction is stronger than ever...resists breakage at all points.

MODEL 2-N

opaque black side shields

medium bridge size only

Same as Model 1-N except with solid black plastic side shields to eliminate distracting glare from adjacent operations or lights.



MODEL 3-N

"blackout" plastic frame

medium bridge size

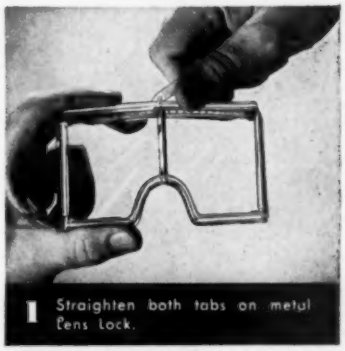
Opaque black frame eliminates glare from overhead lights or adjoining operations. Recommended for precision workers. Suitable with snap-in green filters Nos. 3 or 5 for welders' helpers. NOT DESIGNED FOR WELDERS.

MODEL 30

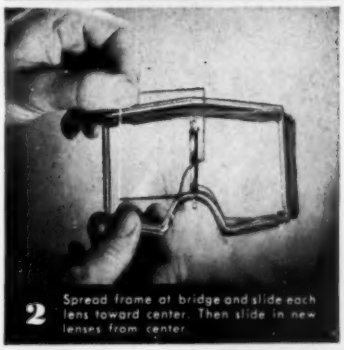
crystal clear plastic frame ***extra large bridge size***

Same as Model 1-N with extra-wide frame to fit over wide, safety-lens spectacles. ALSO MODEL 31—Same with black opaque side shields. ALSO MODEL 32—"blackout" plastic frame.

How to replace lens in all square models:



1 Straighten both tabs on metal Lens Lock.



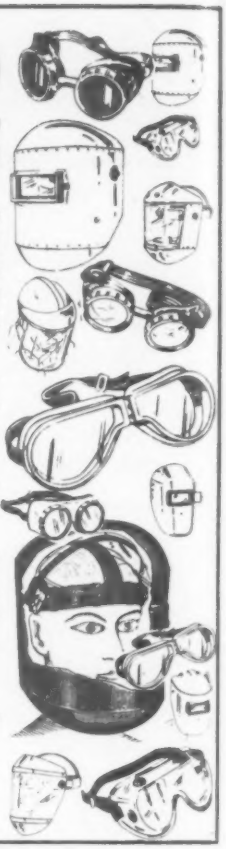
2 Spread frame at bridge and slide each lens toward center. Then slide in new lenses from center.

3 Insert new Lens Lock (supplied with *new lenses*) and bend down tabs at top and bottom.

*T. M. Reg.

WATCHEMOKET OPTICAL CO., INC. • PROVIDENCE, R. I.

202 DIFFERENT EYE AND FACE PROTECTORS



No matter what your work, or what you may require in Eye and Face Protection — the Sellstrom Catalog shows 202 different items—*Welding Helmets, Shields, Goggles, Lenses, Dust Filters, Masks, Hoods, Eye Glasses, Respirators, Eye Shades, Sweat Bands*—and all sorts of accessories for special uses.

The catalog lists goggles for 36 different purposes, all sizes and styles: Welders', Grinders', Industrial, Laboratory, Miners', Smelters', Sport, Therapeutic, X-Ray, and every other conceivable use.

Whatever you require in Face and Eye Protectors, Sellstrom has it — top quality, moderate prices — prompt service.

Write us for the name of a nearby jobber selling Sellstrom Eye and Face Protectors. Or, if you prefer, write for our big catalog which illustrates and describes our complete line of Eye and Face Protectors.

sellstrom MANUFACTURING COMPANY

Eye and Face Protectors

622 North Aberdeen Street Chicago 22, Illinois

THERE'S SAFETY IN THESE NUMBERS

No. 31 Grinders and Chippers Goggles

No. 335 Welders Coverspec Goggles

"CHAMPION"

EYEGARDS

with 10 way ventilation

"NEXT BEST THING TO YOUR EYES"

Compare Eye-Gards with higher priced goggles and you will find they give you the same in eye protection at far less cost. They're the goggles that provide greater comfort because the lightweight plastic frame is molded to form-fit the face . . . greater protection because the goggles are impact-resisting . . . greater ventilation through three large vents at side of cup and seven additional vents around the lenses. Cool and fog-free. With all their exclusive features, they cost no more than ordinary goggles. Get Eyegard "Champions" on your next order.

Write for free catalog of Eyegard Equipment . . . it will save you money!

AMERICAN INDUSTRIAL SAFETY EQUIPMENT COMPANY

3501 Lakeside Avenue Cleveland 14, Ohio

DIVISION OF THE BURDETT OXYGEN COMPANY • CLEVELAND OHIO

Eye Protection

(From page 70)

Heat-treated cover lenses can be provided to protect filter lenses against pitting and scratching. Heat-treated filter lenses are also available.

Face Shields

Face shields of transparent plastic give eye and face protection on such jobs as metal sawing, working with chemicals, buffing, sanding, light grinding, bottle manufacturing, etc.

They should not be used for welding, heavy grinding or other operations where resistance to severe impact is necessary. Shields may be worn over spectacles.

Wire mesh screens are used for pouring low-melting-point metals, as in babbiting. The mesh stops splashes of metal and allows better ventilation than a solid shield.

Sweatbands, worn across the forehead in hot, humid locations, help prevent fogging of goggles and spectacles.

Non-fogging compounds, applied to the lenses, help to keep the lenses clear.

Hoods and Helmets

Hoods (loose-fitting) and **helmets** (rigid frame) of various types are worn to protect the face and head

against hazards which do not involve heavy impact.

These are equipped with windows but goggles may be worn underneath. If toxic fumes, dusts or gases are encountered, an air line may be supplied. As these hoods are rather warm, an air line may also be desirable for comfort.

Fabric hoods protect the wearer from nuisance dusts, paint spray, etc.

Fire-resistant duck and asbestos hoods are used for varying degrees of exposure to heat, as in furnace and burning operations and fire fighting.

Hoods and helmets of rubber, (natural or synthetic) plastic film, and fabric impregnated with rubber or plastic provide protection against sprays and splashes of acids, caustics, organic solvents, etc. Not all of these materials are resistant to all exposures and the manufacturer should be consulted.

Abrasive blasting helmets. See Respiratory Protection.

Fitting goggles. Prescription glasses should be fitted by a refractionist but fitting plano goggles also requires training and experience. Many optical companies offer instruction in this work. Unless goggles are fitted properly there will be considerable opposition to the eye protection program.

Cleaning and sterilizing. Both goggles and spectacles become smudged and facilities for cleaning them on the job are desirable. Stations which dispense cleaning liquid and tissues encourage frequent cleaning.

Goggles worn continuously by one person should be cleaned and sterilized at frequent intervals, as well as those reissued to other employees. See Industrial Data Sheet No. D-Gen. 16, "Cleaning and Sterilizing Goggles and Respiratory Equipment."

Goggle cases. Goggles may be damaged if carried loose in the pock-

—To page 85

Cleaning stations encourage employees to keep goggles and spectacles clean. Some dispense cleaning liquid and tissues. This one dispenses specially treated tissues for cleaning lenses. (Dow-Corning Corp.)

TYPE J-1 EYESHIELD, shown with 6-inch clear visor.

"They're Not Kidding"

3 VISOR DEPTHS:

No, safety experts are not kidding when they say that eye injuries cost far more than the cost of adequate protection.

The Featherlight Type J-1 Eyeshield is used for metal pouring and finishing, spot, gun, and flash welding, wood working, etc.

The extruded plastic headgear, moisture proof and easily sterilized, has sweat band for greater comfort. A pivoted spark deflector which protects the forehead carries the replaceable visor, snapped to the outside. This visor is made of fire repellent clear plastic, made in three thicknesses; also in light, medium, and dark green .020" thick only. All are available in three depths, are 11 inches wide for full face protection, and have wire-reinforced binding.

Jackson Eyeshields are sold through distributors in principal cities of the U.S. and Canada.

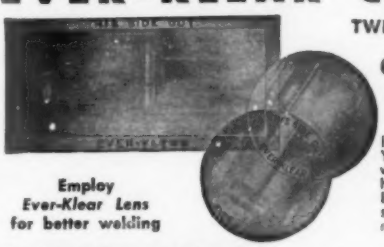
3 VISOR THICKNESSES:
.020"
.030"
.040"

JACKSON
PRODUCTS
WARREN · MICHIGAN

SAFETY GOGGLES · SPECTACLES · EYESHIELDS

EVER-KLEAR COVER LENS

TWENTY YEARS OF PROVEN SERVICE



Employ *Ever-Klear Lens* for better welding

Clear Vision

Comfortable Vision

Is what EVER-KLEAR Cover Lens gives you. You can't do your best welding unless your vision is clear and comfortable. Thousands have found this to be true after using EVER-KLEAR Cover Lens. They give a keen sharp view of the weld always. They do not pit.

Size 2x4½" for arc-welding shields ..... $2.40 per dozen
Sizes 46½ to 50 M.M., for goggles ..... .35 per pair

Contact your nearest Jobber. If they cannot supply you, send order direct, giving Jobber's name.

405 PENN AVENUE F. R. FAULK, DISTRIBUTOR PITTSBURGH 22, PA.

TO ANY LIST OF SAFETY REGULATIONS AN ADDITIONA GO

"Call Your Nearest AO Safety Products Representative for the Complete Line in Industrial Protection"

Yes, it's a good rule to follow because the AO Safety Products Representative can help you *6 Ways:*

1 He represents a *complete* source of supply which saves time in selection, ordering and delivery.

2 He represents a *quality* source of supply—the AO brand name is an established name in industrial protection wherever a goggle, a respirator or clothing is worn.

3 Because he represents a *complete* line he can recommend the *precise* product that will meet your needs exactly in goggles, respirators and industrial clothing.

4 He is equipped by training and knowledge to make the right recommendations in meeting both single or multiple hazards.

5 As a representative of a company that is continually pioneering and improving industrial protection in one of the world's leading research laboratories, he can advise you about the latest developments that enable workers to work more safely, more efficiently and more comfortably.

6 He is handy to you—in one of 283 American Optical Company Branch Offices conveniently located in all principal industrial centers. Call on him—*and count on him!*

American Optical
COMPANY
SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts

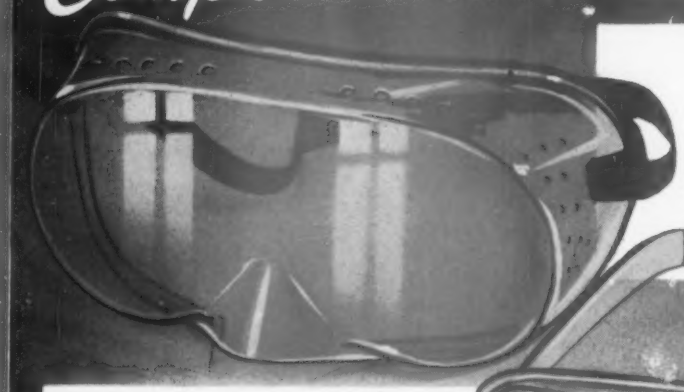
A GOOD RULE TO FOLLOW IS:

AO SAFETY Equipment

***AO's Complete Line of Safety Equipment Includes* SAFETY**

- GOGGLES · LENSES
- HELMETS · HAND SHIELDS
- FACE SHIELDS
- RESPIRATORS
- GLOVES and MITTENS
- LEGGINGS and SPATS
- ARM PROTECTORS
- APRONS and BIBS
- COATS and JACKETS
- FINGER COTS
- PANTS and OVERALLS
- SWEATBANDS
- LADDER SHOES
- MISCELLANEOUS

Companions... FOR COMPLETE EYE PROTECTION



SAF-I-SHIELD

All Purpose Safety Goggle

Made of "Optilite"—lightweight, optically correct, strong, comfortable. Can be worn over prescription glasses—one size fits everyone. A goggle everyone will wear with pride.

SAF-I-SPEC

Smart Appearance, Instant Snap-On Temples

Made of "Optilite"—weighs less than one ounce. Temples clip on or off instantly—easily adjusted to fit any wearer's face. Tough—rugged—this is the spectacle safety engineers have been waiting for. LOW COST.

A Sensational NEW SALT TABLET

THE PACKAGE IS THE DISPENSER

"PEP-UP" Tablets come to you in sanitary, factory-sealed Dispensers at no extra cost. THROW AWAY DISPENSER WHEN EMPTY. HANG UP A NEW ONE.

IMPREGNATED (controlled dissolving)

WILL NOT CAUSE NAUSEA OR STOMACH DISTRESS

PEP-UP Impregnated (controlled dissolving) SALT TABLETS are produced by an exclusive patented process which forms a complete coating around each crystal of salt. This slow dissolving tablet eliminates nausea and digestive disorders usually experienced when taking salt. The controlled dissolving **releases some salt immediately,** which insures **quick salt replacement,** but not in sufficient quantities to cause nausea.

"PEP-UP" ENTERIC COATED SALT TABLETS

We also manufacture the original patented "PEP-UP" Enteric Coated Salt Tablets. The enteric coating prevents them from dissolving in the stomach and causing salt sickness or nausea. Used for years by many of the largest firms in the country, these tablets have employee acceptance and are low in price. Also packaged in "EXPENDABLE" DISPENSERS.

Also manufacturers of Vinylite "TUFFY" APRONS and the SAF-CO-METER Carbon Monoxide Indicator. Write for literature and prices on all of our products.

UNITED STATES SAFETY SERVICE CO.

Kansas City 6, Missouri • Branches in Principal Industrial Cities

Eye Conservation

(From page 81)

et or with tools. With a case the worker is more likely to have goggles with him and to take better care of them.

Supply. In some companies the supply is kept in the main supply department. In larger plants a supply of goggles and repair parts may be kept in each shop. Some operate goggle carts with a trained attendant who makes the rounds, cleaning, adjusting, repairing and replacing goggles on the job.

Planning an Eye Protection Program

1. Make periodic surveys of work areas for eye hazards.
2. Provide type of protection suitable for the job — goggles, shields, masks, hoods, etc.
3. Provide goggle-adjusting service and encourage employees to keep their goggles in adjustment.
4. Be sure that all those in the work area have goggles, including employees from other departments.
5. Allow no visitors without eye protection.
6. Supervisors should wear goggles for their own protection as well as to set an example to employees.
7. Encourage employees to report foreign bodies in the eye immediately for medical treatment.
8. Make provision for corrective goggles for those who need them.

REFERENCES—SECTION 2

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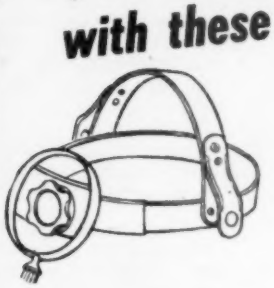
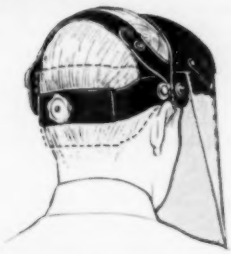
ANOTHER STASAFE PRODUCT

FIRST IN COMFORT with these Patented Features





Ratchet Adjustment
For the best fit —instant adjustment to 32 fractional head sizes. Shield perfectly balanced and securely held by outside adjustable friction joints.

Hinged Offset Headgear
The offset feature drops the headband below the troublesome "bump" in the back of the head. Hinged feature assures adjustment to the head shape.

StaSafe No. 14 StaSafe No. 15 Open Hearth Shield

The above are representative of the complete StaSafe line which includes a wide selection of face and eye shields, Router's masks, Flash masks, and Open hearth shields. You'll want additional information on the swift method of front replacement—on the spring retainer clips to secure visors, and all the facts about the superior construction of StaSafe Face and Eye Shields.

WRITE FOR DESCRIPTIVE BULLETIN No. 254

STANDARD SAFETY EQUIPMENT COMPANY

232 W. ONTARIO · CHICAGO, ILLINOIS

PROTECTION . . . . .

from irritating nuisance dusts and paint sprays for eyes, head, face and neck

G-S DUST AND PAINT SPRAY HOOD

Extremely light in weight with single, wide-area clear plastic window affording natural wide-angle vision.
$30.00 dozen. 10% discount in dozen lots. Sample sent postpaid for $2.50. Order direct from

GENERAL SCIENTIFIC EQUIPMENT CO.

2721 W. Huntingdon St., Philadelphia 32, Pa.

Send for 1950 catalogue of Safety Equipment.

Safety Clothing

SAFE clothing may be any type of clothing that is clean, in good repair and suitable for the job. Almost any garment offers some protection against minor hazards.

Safety clothing refers to specific garments designed for certain hazardous jobs where ordinary work clothes would not provide sufficient protection.

Proper fitting is essential in all work clothing. Long, loose sleeves and neckties may get caught in machinery. Trouser cuffs may cause tripping.

Clothing soaked in oil or solvent may be ignited or may cause skin irritation. Cleanliness is also important for psychological reasons.

Some companies furnish laundered overalls, coveralls, aprons, smocks, and other garments in occupations where extreme cleanliness is necessary because of the product or because of health-hazardous processes.

Hazards that require special protective garments include high temperatures, hot or corrosive substances, flying particles, sharp or rough edges, etc. See chart on page 8 for types of garments and materials for various hazards.

The following are essential in all types of work clothes:

1. Adequate protection.
2. Comfort and freedom of movement.
3. Durability
4. Appearance

Appearance of clothing is particularly important with women employees but men are not indifferent to it.

Standards. Specifications established by the Federal Government have provided widely used standards for many years. During the war the American Standards Association approved a series of "War Standards for Protective Occupational Clothing —Series L18". These are to form the basis of permanent standards to be completed in the near future.

These specifications cover protection against sparks, molten metal, infra-red and ultra-violet rays, and limited impact forces. Details of pattern, design, workmanship and range of sizes are also included.

Protective Materials

Asbestos is the preferred material for protection against intense heat, and flame hazards. Many garments are made of this material, including complete suits for fire-fighting and rescue work.

Airplane crash fires have focused attention on the development of more effective protection for firefighters and rescue crews. These suits use not only insulating material against conductive heat but also a radiation barrier of reflective material, such as silver foil. Suits of this type have been developed by the U. S. Air Force.

Wool clothing should be worn under asbestos garments where intense heat is encountered.

Leather in various grades is used for protective garments. Chrome tanned leather affords protection from sparks, molten metal, infrared and ultra-violet rays, although leather deteriorates under continued exposure to heat. For severe exposures garments should be of asbestos.

Leather also provides protection from limited impact forces. Padded leather or fabric aprons and hard fiber or metal protectors for the abdomen absorb much of the shock of hard blows. Leather reinforced by metal stitching or wire staples is resistant to cuts and abrasion.

Impervious materials of many types provide protection against dusts, fumes and some liquids ranging from harmless to corrosive. They are important in handling materials which would cause chemical burns or dermatitis after repeated exposure. Included in this classification are natural rubber, synthetic rubber, plastics and coated fabrics.

Rubber, natural and synthetic, is widely used in the chemical industry because it resists acid, caustics and other corrosive substances. Rubberized garments are useful when handling low concentrations of acids and non-caustic liquids. The well-known properties of rubber as a non-conductor of electricity has resulted in its wide use around electric equipment.

Protective garments worn by furnace tappers —chrome leather spats, a heavy canvas apron, chrome leather gauntlets, canvas sleevelets, and fire-resisting face shield.

Synthetic rubber has found numerous applications in safety equipment. There are many varieties of synthetic rubber with widely differing properties.

Flame-resistant duck, a lightweight fabric, is quite strong and will outwear ordinary material used in work clothes. For protection against extreme heat, asbestos should be used.

Water-resistant duck is recommended in exposures to water and non-corrosive liquids. It combines strength and durability with light weight.

Plastics are finding increasing use in safety equipment. Some of the synthetic resins are rolled or calendered onto fabrics. Others form strong and pliable films for safety clothing.

Welder's Clothing

Safety clothing is as much a part of the arc welder's equipment as the helmet and goggles. Cotton shirts and dungarees worn in warm weather can be ignited quite easily and the protection of chrome-tanned leather may avoid serious burns and loss of valuable time.

Welders' leather garments include overalls, pants, chaps, aprons, jackets, sleeves, gloves, mittens and spats.

Garments should be of good quality leather, solidly constructed. Fastenings must prevent gaping and should be so designed that the wearer can get out of the garment quickly. There should be no turned-up cuffs or other projections to catch hot metal. Pockets should be equipped with flaps.

Hands and Arms

FINGERS, hands and arms are involved in more than one-third of all reported industrial injuries. This is not surprising since no parts of the body are more exposed to cuts, scratches, bruises and burns in the course of the day's work.

Finger movement is necessary for practically all work and this makes protection difficult. For the forearm semi-rigid protectors are often practicable.

Finger stalls, gloves, mittens, and hand pads are made of a variety of materials to protect against hazards of the job.

Some of the common materials and their uses are:

Canvas, the least expensive and least durable material, is satisfactory for light work. Duck and terry cloth

—To page 92

DUPOR no. 46

U.S.B. of M. approved for type A and lead dusts. 46 sq. in. twin filters.

$2.50

Keep the air you breathe Clean as a Whistle...

WITH

COVER'S

U.S.B. of M. APPROVED Respirators

DUPOR no. 24

U.S.B. of M. approved for type A dusts. 24 sq. in. twin filters.

$2.50

DUPOR no. 40

U.S.B. of M. approved for type A dusts. 40 sq. in. twin filters.

$2.50

LIGHT WEIGHT • GREATER VISIBILITY • NO BLIND SPOTS • CONTROLLED BREATHING
FACE CLOTH FOR PERSONAL SANITATION • PANORAMA VIEW • EXCLUSIVE PATENTED FEATURES

Write for full information on the complete line of DUPOR Respirators and H. S. Cover Gas-Tight, Fog-Proof GOGGLES

H. S. COVER

SOUTH BEND, INDIANA

for POSITIVE PROTECTION against HEAT and ABRASION!

PROTECTIVE WHEELER APPAREL

No. 1500 — 1505 Here is our beautiful new dark grey 100% reprocessed Wool Suit. Safe, soft, and comfortable to wear. Fire-resistant, 100% wool 32 oz.) will stand severe heat conditions. This new wool has been enthusiastically received by Safety Men everywhere, and their "Repeat" Orders speak louder than just words! Write for sample swatch.

No. 13338 "Picture Window" Helmet of Underwriter's Grade Light Basket Weave Asbestos Cloth, with wire head frame and adjustable, padded head band. Removable heat-resistant Pyrex polished plate glass lenses for full vision; fine wire mesh port on Helmet side for air cooling; reveal fitting examples of WHEELER design and ingenuity, with accent on Safety.

IT'S "Wheeler Wear"

No. 3000 — 3005 Our popular Flame-Proof ★Jean Cloth Suit and "Peak" Cap, thoroughly impregnated with our own "non-smold" flame-proofing treatment. Smartly tailored with full-swing raglan sleeves. All exposed seams are fell sewn. Flame-proof Jean Cloth fits the stringent safety requirements for light molten metal splashes, fire, or spark hazards. It comes in attractive, wearable olive green shade. It's the Steel Workers favorite. Write for sample swatch.

★More and more of our Customers are ordering Jean Cloth Garments, in preference to Duck, because Jean Cloth does everything that Duck can do, *only better!*

No. 807 Asbestos Gloves—our best seller! Made of Underwriter's Grade Herringbone Weave Asbestos Cloth. Well insulated gloves with a cool, comfortable Kelly green lining. Leather thumb seam strap, and leather palm and thumb reinforcement at critical points of stress and strain.

No. 503 Spats, of heat-resistant, chrome tanned, split cowhide leather, with adjustable leather instep and ankle straps. Test them out for rough, rugged wear.

No. 777 Leg Safes made of heat-resistant, chrome tanned, split cowhide leather. High tension clock steel spring stays give leggings snug fit. Fully adjustable — on and off in a jiffy.

Wheeler PROTECTIVE APPAREL, INC.

Write for our new Catalog No G98

224 W. HURON ST. • CHICAGO 10 ILL.

GARDWELL Products

PERSONAL PROTECTION

. . . . from Recommended Materials!

. . . GARDWELL UNDERWRITERS GRADE ASBESTOS SUITS

No. 760

Made from selected close woven Underwriters Grade Asbestos Cloth the jumper suit illustrated is reinforced with special chrome tanned heat resisting leather. Collars are of wool. Snap fasteners are used in front for safer, quick removal. Seams are double sewn.

. . . GARDWELL UNDERWRITERS GRADE ASBESTOS GLOVES

No. 1744

Where heat and flame are the chief hazards asbestos clothing, gloves and mittens are supreme. GARDWELL asbestos clothing includes everything from a complete suit with helmet, gloves, coverall, etc.

Gardwell Underwriters Grade Asbestos Mittens

This special pair type mitten is 14" long. High grade chrome leather reinforcement on the palm and thumb extends about an inch onto the back thus reinforcing all seams. The reinforcement on the thumb also covers the back as illustrated to protect the thumb seams. Has woolen lining, made large for quick removal.

No. 116

. . . Gardwell Underwriters Grade Leather

For rough service in protection from sand, steel shot, electric welding, etc., you can't beat GARDWELL leather leggings, welding jackets, sleeves, clothing etc. The GARDWELL "FRANK" Knee Legging illustrated is a favorite in thousands of plants all over the country.

No. 500

INDUSTRIAL SAFETY EQUIPMENT ASSOCIATION — UNIVERSAL SAFETY

Also items from GARDWELL Ply-Garb, Oil-Chem, Canvas, Fire-proofed Duck and Rubber—all made from highest quality materials, by expert workmen and backed by over 25 years of experience in designing and manufacturing safety clothing and equipment.

Send for a copy of our complete catalog of GARDWELL Safety Clothing and Devices

Safety CLOTHING AND EQUIPMENT Co.

DESIGNERS AND MANUFACTURERS

7016 EUCLID AVENUE • CLEVELAND 3, OHIO

PHONE ENDICOTT 1-1722

for the Most Modern in Safety Equipment

McDonald
SAFE-T-HAT

Made of light aluminum alloy, ribbed for extra strength, with full-floating, shock-absorbing interchangeable and adjustable headband. Two shell sizes fit all heads. Weighs only 11¾ ounces.

McDonald Clear-Vue
DUSTFOE RESPIRATOR

Light, comfortable, durable. Approved by U. S. Bureau of Mines for all dusts, including lead dust, or pneumoconiosis-producing dusts and mists. Aluminum face piece cushioned to fit comfortably. Clear plastic filter holder permits visual checking of filters.

McDonald
KANISTER KIT

Easily mounted on vehicle cabs, in buildings—or in any working area—McDonald Kanister Kit saves precious time and offers on-the-spot protection. Roll-up kit of clear vinyl contains essential materials—is completely protected by weatherproof, metal canister and may be released instantly. Roll-up kits are available in standard assortments or may be made up to your specifications.

——and many others. Write for information and prices.

B. F. McDONALD CO.

5112 SOUTH HOOVER STREET, LOS ANGELES 37, CALIFORNIA

1255 HOWARD STREET, SAN FRANCISCO 3, CALIFORNIA

2321 MILAM STREET, HOUSTON 6, TEXAS

No. 550—Work Glove. Made from split cowhide. A serviceable glove for ordinary wear.

No. 146-A — Asbestos mitt with asbestos reinforcement.

No. 6 — Welder's glove. Back fully lined for insulation. No exposed back stitching.

No. 796 — Hand Pad. Made of grain leather. Thumb reinforced. Back is open.

Hand Protection...

FOR EVERY INDUSTRY

OTHER KIMBALL SAFETY PRODUCTS

EYE PROTECTION: Spectacle Goggles, Welding Goggles, Composition Goggles, Sideshields.

HAND PROTECTION: GLOVES; Welder's, Asbestos, Steel Stitched. MITTENS; Welder's, Asbestos, Steel Stitched.

BODY PROTECTION: CLOTHING; Wool, Flame-Proofed Cotton. LEGGINS and SPATS; Leather, Asbestos, Flame-Proofed Cotton.

APRONS: Leather, Asbestos, Flame-Proofed Cotton.

• Illustrated above are four representative items from the complete KIMBALL line of Industrial Hand Protectors. Every KIMBALL Hand Protector is made from the best materials and the workmanship is unconditionally guaranteed. As the largest producers of welding gloves we consider our hand protectors to be without equal.

Whether your need is for leather, asbestos, or a combination of both, you will find KIMBALL able to fill your requirements to complete satisfaction. For catalog showing the complete line of KIMBALL Hand Protectors ask for Bulletin 350.

Kimball

SAFETY PRODUCTS COMPANY

9310 WADE PARK AVENUE
CLEVELAND 6, OHIO

ANOTHER STA-SAFE PRODUCT

UNEQUALLED Chemical Resistance

GRA-LITE

Gra-Lite gives you protection that is unequalled in the safety garment field . . . protection covering a wider range of chemical hazards . . . protection that you can test because you want ***proof!*** We'll send sample swatches of Gra-Lite for investigation—or for your convenience our laboratory is open for consultations — all without obligation.

This new fabric is tough—Gra-Lite compound thoroughly penetrates the fibers of the base fabric providing resistance even on the ***inner surface of the material*** — for this reason it withstands the cleaning agents used in launderings and has great resistance to mildew and rot. Abrasion resistance?—just test a sample swatch!

With worker comfort in mind Gra-Lite was designed more than 40% lighter than ordinary impervious fabrics — 12 standard sizes are offered in coveralls, and with new design features workers are assured of the best fit and freedom of movement.

WRITE TODAY FOR A FREE SWATCH
(Please state the hazard to be tested)
AND DESCRIPTIVE BULLETIN NO. 259

STANDARD SAFETY EQUIPMENT COMPANY
232 W. ONTARIO · CHICAGO, ILLINOIS

LEADING MANUFACTURER OF SAFETY GARMENTS

HOLCOMB PROTECTION

PRODUCTS INCLUDE

GLOVES	SLEEVES	FOUNDRY LEGGINGS	JUMPER SUITS
SPATS	HATS	FOUNDRY BLANKETS	OVERSHOES
HELMETS	PANTS	FINGER PROTECTORS	CURTAINS
MITTENS	COATS		KNEE PADS
ARM PROTECTORS	MASKS		HAND PADS
	APRONS		

MADE IN ASBESTOS — LEATHER — FIREPROOFED DUCK

HOLCOMB SAFETY GARMENT CO.
118 North Jefferson Street **Chicago 6, Illinois**

Hands and Arms

(From page 86)

are also used for handling objects which are not excessively hot.

A strong, closely woven variety of terry cloth is used for "hot mill" gloves.

Leather is more expensive and more durable for most jobs. It offers greater protection against cuts and abrasions.

Chrome leather is used where there is exposure to sparks or molten metal. However, no animal or vegetable material will stand continued excessive heat.

Metal staples in gloves, mittens and hand leathers give increased protection when handling sharp or rough objects. Metal-studded gloves should not be worn around electric apparatus.

Asbestos is used where hands must be protected against extreme heat, as in steel mills, heat treating plants, welding, galvanizing, glass manufacturing, etc.

Asbestos gloves may be obtained unlined or with wool lining for added comfort and protection.

Rubber, neoprene and pliable plastic films are suitable for chemical laboratories and plants where acids, and other corrosives are handled.

ACME

. . . the Gas Mask that Checks "HUFF and PUFF"

You can wear the Acme Full-Vision Mask two or three times as long as others without worrying about "huff and puff." An exclusive Acme feature, the Dead Air Check Valve, actually limits the amount of carbon dioxide the wearer rebreathes and thus helps to check breathing difficulties at their source.

This is another Acme innovation that proves that protection can be comfortable.

Write for the complete story on Acme Gas Masks for all occupational hazards.

ACME PROTECTION EQUIPMENT CO.
3037 WEST LAKE STREET
CHICAGO 12, ILLINOIS

Neoprene and plastic are particularly useful where petroleum products and some organic solvents are handled. However, synthetic films vary in their resistance to different chemicals and the manufacturer should be consulted about protection in specific exposures.

Fabric coated with rubber, neoprene or plastic are used for light cleaning operations. They offer greater protection against abrasion than uncoated fabric.

When rubber or synthetic gloves are worn for long periods, a lightweight cotton liner is desirable. If no liner is available talcum powder should be shaken into the gloves before wearing.

Rubber and asbestos gloves should be long enough to come well above the wrists. If long flaring gauntlets are worn they should be equipped with locking devices to assure a snug fit about the wrists. Sleeves should be kept rolled down, leaving no skin exposed.

Metal mesh gloves are used in butchering operations, such as boning and cutting. They should fit snugly.

Generally, gloves should not be worn when operating revolving machinery. An exception is buffing and polishing on high-speed lathes where

—*To page 95*

IPCO UTILITY RAIN SUIT

Offers finest all-weather protection.

Absolutely waterproof and windproof . . Patterned roomy to be worn over regular clothing.

Consists of coat, pants and detachable hood. Double texture fabric with a sheet of solid rubber vulcanized in between assures waterproof qualities. Olive drab color.

IPCO

Safety Equipment for all Industries

Write for Bulletin K-30

INDUSTRIAL PRODUCTS COMPANY

2830 N. FOURTH STREET · PHILADELPHIA 33, PA.

Tested And Proven

10 YEARS EXPERIENCE IN PLASTIC CHEMISTRY PRODUCES

*Trade mark Registered

PLYGLOV*

No. 2100
Regular Knit Wrist Style

No. 2102
Two-inch Cuff Style

No. 2105
Gauntlet Style

No. 2100A
Palmcoated

The Safety Work Glove Better Than Rubber Or Leather

Quality doesn't just happen — it's a result of experience and experiment. That's why PLYGLOVS are far ahead. Ten years experience in plastic chemistry as applied to plastic safety work clothing has enabled us to produce a plastic work glove which will outwear all others; is more comfortable, more flexible, won't become slippery when wet; and is impervious to oils, acids, caustics and water. They will withstand far greater abrasive action.

That's why we can unconditionally guarantee every pair of PLYGLOVS. Judge them yourself under your own working conditions. Find out as others have why they outwear any rubber or leather glove four to ten times. Get a FREE pair and make your own tests.

Free Sample

CLIP THIS AD, attach to your letterhead and mail for FREE PLYGLOV sample pair — make your own test before you buy.

Your Name_____

Title_____

Manufacturers of PLYGLOV and PLY-GARB Plastic Safety Clothing
(Catalog upon request)

THE MILBURN COMPANY

3245 EAST WOODBRIDGE DETROIT 7, MICH.

1950...Our 40th Anniversary

FOR THE NEW

FOR THE ALWAYS BETTER

FOR THE DEPENDABLE

& EFFICIENT

INDUSTRIAL
Safety Apparel

TRADE-MARK

Every transaction involving INDUSTRIAL Safety Apparel is a *contract*... to supply you with the newest, to supply you with constantly improving quality, to supply you with safeguards that prove their quality by their details, by their fit and feel and wear, by their evident value in these days of deflated quality.

Thus, INDUSTRIAL now offers you among other safeguards, an amazing *new* safeguard... the "Woven-Gard." * It is made of a new, far better and more economical material... has dozens upon dozens of uses... is available in a variety of styles. This is but one of many interesting safety features in the INDUSTRIAL line. Tell us your needs or ask for catalog.

INDUSTRIAL GLOVES COMPANY
A CORPORATION
Main Factory: 1723 Garfield Street, Danville, Illinois
Branch Office: Detroit, Michigan • *(In Canada: Safety Supply Co., Toronto)*

No. 14165
Industrial's Finger Guard useful on hundreds of jobs requiring finger and thumb protection only.

No. 644
Industrial's Steel-Grip Gauntlet Glove, steel ribbons over leather strips. A tough glove for tough jobs.

No. 225
Industrial's Leather-Faced Asbestos Gloves with the one-piece construction that eliminates those weak seams at wrist and side.

***Woven-Gard**
Industrial's amazing new safeguard that's heat resistant, oil absorbent, long-lived and economical. Hand spats, open and closed end mitts, gloves, etc.

No. 148
Bib-Type Leather Apron, no seams, one piece, finest chrome leather, 24 x 42". Other sizes. Also flame-proof duck and Underwriters' asbestos.

No. 13475
The Nation's No. 1 Welders Glove. Special tanned heat resistant leather. One piece back—no seams to burn or rip. Wool heat breaker inside. Seams welted at greatest wearing points.

Hands and Arms

(From page 93)

parts become too hot to handle with bare hands.

Linemen's gloves. Rubber gloves worn by linemen and others engaged in electrical work are of a special type made to exacting specifications. They should be tested regularly and discarded when found worn, cracked or punctured.

For line work, overgloves of leather are worn to protect the rubber against damage.

Wrist and Arm. Gauntlets offer some protection to the wrist and arm protectors guard the forearm against light blows. The materials, depending on the protection required, include duck, wool, leather, rubber, plastics, and asbestos.

Protective Creams

Creams and lotions are often helpful in protecting the skin against irritants when safety clothing is not practicable. These products are made in water-soluble and water-resistant types, each in several grades for differing exposures.

Water-soluble creams are used for protection against cutting oils, paints, lacquers, varnishes, etc.

Water-resisting applications are used where the cutting oil, cooling lubricant, or other irritant has a water content of more than 10 per cent. These can be removed with soap and warm water.

To be effective, the coatings should be renewed frequently. They are not intended for protection against highly corrosive substances.

PROTECTION AGAINST CHEMICALS

Acids and Alkalis

When exposed to acids and alkalis, protect yourself by wearing the proper clothing.

1. If there is danger of spills from above, wear acid hood, rubber coverall, gloves and boots. See picture.
2. Where minor splashing is the only hazard, wear goggles, rubber boots, rubber apron and gloves.
3. Tuck the glove gauntlets inside your sleeves.
4. Keep your trouser legs outside your boots.

Remember: The best of clothing is only partial protection. Complete safety depends upon how you handle the chemicals with which you work.

SAFETY INSTRUCTION CARD No. 42
National Safety Council

EVERYTHING BULLARD IN SAFETY

Safety Buyer's Guide... for Greatest Personal Protection with Comfort

Hard Boiled Hat

Fiberglass molded crown—toughest, most resilient made. Permanent molded colors; white or grey standard, phosphorescent at small extra cost, other colors in quantity orders. Full-floating, self-shaping hammock-sweatband, replaceable in seconds. Adjustable size. Light weight. Comfort unequalled. Winter liners, lamp brackets, chin straps available. Write for circular.

BULLARD SAFETY BELTS

Famous Morenci light weight design with extra safety margin. Continuous strand, super-twist webbing. No belt holes or grommets. Snub buckle. Adjustable keepers. Design adapted to belts for mining, construction, marine, petroleum and general industrial use; also in harness and saddle types. New brochure available.

DUST and SPRAY HOODS

Air supplied or respirator types. Featherweight, tough, translucent material. Easy to clean. Full-vision, impact-resistant plastic face pieces are quickly replaceable. Airline Hood has non-fogging, no draft features; Cal. Div. Ind. Safety approved. Respirator hoods incorporate U. S. B. M. approved respirators. Other hoods approved for shot and sandblasting; Acid Hood for safe acid handling. Write for circular.

FIRST AID KITS

Cylindrical kit ideal for use indoors or out; mount on trucks, boats, poles, walls—wherever first aid kits are required. Compact, waterproof. Contains fabric Roll-up, complete with Unit Packets of first aid materials. Other kits include full line of weatherproof and bulk package kits, Pocket Packet and Combination Belt Kits.

Wouldn't you like to receive regularly the pocket-size publication, **"What's New In Safety"?** *It gives highlights of new safety products. Just say "add my name to your mailing list."*

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Write for detailed product literature or see your Bullard distributor or dealer

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275 EIGHTH STREET, SAN FRANCISCO 3, CALIF.

Standard with industry for over 30 years

WILSON RUBBER GLOVES

ACID PROOF · ELECTRICIANS · CANNERY WORKERS · SURGICAL
SAND BLASTING · SOLVENT PROOF · FINGER COTS · TANNERS MITTENS

CRUDE NEOPRENE NATURAL

RUBBER * SYNTHETIC * LATEX

SEE ALL LISTINGS FOR OTHER WILSON PRODUCTS

HIGHER QUALITY · LONGER LIFE · LOWER COSTS

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1210 GARFIELD AVE. S. W. · CANTON 6, OHIO, U. S. A.

The World's Largest Exclusive Manufacturers of Rubber Gloves

DESIGNED FOR GREATER SAFETY

THE NEW
KENNEDY "VICTORY" CAP

The Kennedy "Victory" cap protects all the hair—all the time. Full, wide, snood-type back permits easy and complete coverage of the hair. More easily put on right than wrong. Adjustable to all head sizes.

WRITE DEPT. NS FOR COMPLETE INFORMATION

V. E. KENNEDY CO.
5004 W. BURLEIGH STREET
MILWAUKEE 10, WISCONSIN

You, Too,
WILL SAY

"This is the Finest Apron on the Market"

More and more customers tell us that they have never seen garments like ours which provide complete protection against grease, acids, etc., yet are light weight, flexible and wear resistant. The solid plastic sheeting we use (not a coated fabric) was developed originally for the U. S. Government and has been tested by 72 hour immersion in concentrated acids without noticeable effect.

The PROTEXALL line includes aprons of all types, smocks, bibs, arm guards. Workers like them instantly. Send for descriptive circular.

Manufacturers' agents wanted. Exclusive territories open.

Protexall Apron Company, Inc.
Green Lake, Wisconsin

For Safety
Guardi-Ann Hat
U.S. PATENT NO. 1,535,996

Combines utmost protection and style. Exclusive patented features found in no other hat.

Write for Free Sample or Order Direct from us

$13.50 dz.

CHIC MAID HAT MFG. CO., Inc.
630 HIGH STREET
BUFFALO 11, N. Y.

B R E C K

BRECK pH7 PROTECTIVE CREAM GUARDS AGAINST HARSH INDUSTRIAL MATERIALS

Skin irritations caused by working with industrial materials can be prevented with adequate skin protection. Breck pH7 Protective Cream spread onto the skin of the hands, face or arms will form a protective film that helps prevent direct contact with many harsh industrial materials. People working with cooling lubricants, cutting compounds, lime, paint, rubber dust and petroleum solvents will find that these materials are easier to remove after using Breck pH7 Protective Cream. The new dispenser top for the pound jar of Breck pH7 Protective Cream makes application easier, more sanitary, and saves the worker time.

Request the new dispenser top with your next order of the pound size Breck pH7 Protective Cream.

JOHN H BRECK INC · MANUFACTURING CHEMISTS · SPRINGFIELD 1 MASSACHUSETTS
NEW YORK · SAN FRANCISCO · OTTAWA CANADA

Safety Belts and Harness

SAFETY BELTS and harness equipment for workers at high levels has proved to have a double value. It not only furnishes physical support but also eliminates apprehension about falling.

Occupations in which safety belts and life lines are commonly used include linemen, window cleaners, structural steel and bridge workers, cranemen, shipbuilders, forestry workers, mechanics, miners and painters.

In selecting a safety belt, two types of use must be considered—"normal" and emergency. Normal use consists of comparatively light stresses applied during regular work. These stresses rarely exceed the total static weight of the user, and usually are considerably less than that.

Emergency use means stopping a man safely when he falls. This may subject every part of the belt to an impact loading many times the weight of the user.

Types. Several types of safety belts and harness have been developed for certain occupations.

Conspicuous among these are the lineman's belt, with safety strap, and the window cleaner's belt. Both the belting material and the hardware for these types of belts have received much study. These belts are usually serially numbered and dated so that records of age and condition may be kept.

For many occupations a lighter and less cumbersome belt will provide ample protection against falls. These may be of the simple body type or the harness type. Both have dees to which a lanyard is attached. The harness type has the advantage of distributing the shock over shoulders, back and waist instead of merely at the waist.

Safety harness with lanyard attached expedites the rescue of workers overcome by gas or vapors or injured in confined spaces. Such equipment should be worn by workers entering tanks, bins and underground passages where such hazards may exist.

Materials. Both leather and webbing belts are furnished by most manufacturers.

Well tanned and well oiled leather is not easily attacked by most chemicals but it should not be left in contact with them. Regular cleaning after use is important.

Leather ¼-inch thick and 1½ inches wide will have an ultimate strength of about 500 pounds. This is adequate for lifting a man out of a tank or bin.

Webbing will stand much more heat than leather, and when soaked in water will dry out in its natural condition. Friction buckles can be used with webbing, avoiding the loss of strength at buckle holes.

A ½-inch manila rope lanyard will have an ultimate strength of about 2,600 pounds.

Belts intended to check a fall demand strength proportionate to the possible distance of fall and weight of body. A 2" by ¼" leather belt would probably arrest the fall of a window washer at 6 feet. It might break at a 10-foot fall.

For a comfortable margin of safety, a window cleaner's leather belt should be at least 3" by ¼", or the equivalent.

Special types of webbing are available for certain uses. It can be wax treated to resist paint and mildew. For the chemical and petroleum industries webbing is impregnated with neoprene which resists acid conditions.

The longer the free fall, the greater the impact force exerted upon the harness and lanyard. It is therefore advisable to tie off the line as short as the necessary movements of the worker will permit.

If long free falls are possible, the harness should be designed to distribute the impact force over the legs and chest as well as the waist.

PROTECT EMPLOYEES *against* **UNNECESSARY HEAD INJURY**

Here, at last, is a light weight, plastic safety helmet, resistant to 3,000 volts of electricity, and by actual test, able to sustain 80 foot pounds under ball impact. What's more, the Paramount safety helmet is light as a feather—comfortable, waterproof, adjustable to head sizes (6½ to 8), and with enough clearance space between head and helmet crown to cushion and absorb intense impact. Genuine leather suspension band has long life and stands up under years of use.

For Use in Mines

A miner's lamp bracket, adaptable to every type of lamp, can be furnished either on helmet or cap. Being entirely a non-conductor of electricity, this is the safest miner's helmet available.

Winter Lining

For increased warmth, a two piece lining with a flannelette facing is provided. The lining is sanforized, warm, and is made in a full range of head sizes.

As the producers of millions of M1 Army helmet liners, the famous Cairns-Paramount Firemen's helmet, the Army, Navy and Civilian Air Corps crash helmet for jet pilots and other air corps personnel, the Army Quartermaster Tank Corps helmet, we are specialists in this field and offer you greater protection with lighter weight.

The Paramount helmet and cap are produced under one or more of these patents—No. 2-420-522, No. 2-423-076, and other patents are pending.

ORDER THRU YOUR DEALER OR, WRITE DIRECT TO

PARAMOUNT RUBBER COMPANY

Synthetic Rubber & Plastic Engineers & Mfgrs.

10401 Northlawn Avenue **Detroit 4, Michigan**

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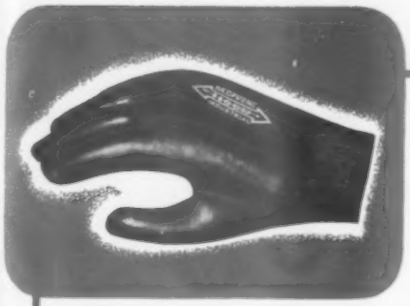
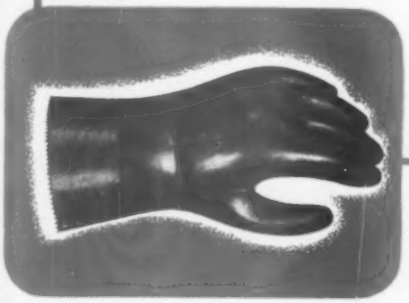


Model 4703—Full Neoprene coated, knit wrist style used in all types general industry. Liquid proof, curved fingers, no seams on working surface.

Model 7701 — Fully Neoprene coated with (4") cuff for use where dipping operations, spray or splash are not too high.



More Protection means More Production...

be sure with NEW, IMPROVED

HOOD

CURVED-FINGER GLOVES!

The job of meeting all-important production deadlines can be made much easier by providing the best possible protection for *your* employees' hands. To be *sure* of this protection from abrasives, sharp edges, chemicals, oils, etc., there is a Hood Industrial Work Glove that will do the job better! Two of those gloves are shown here.

Hood has built an enviable reputation in its more than 50 years, and that reputation, plus the world famous research that has made B. F. Goodrich "First in Rubber" stand behind every pair of these longer lasting, more comfortable, more flexible gloves. Write today for our latest catalog showing the entire line of Rubber gloves both Neoprene coated and Plastic coated.

HOOD *for NEW Safety plus*

HOOD RUBBER CO.
Watertown, Mass.
Division of the B. F. Goodrich Company

"KNEE DEEP" IN SAFETY WITH

JUDSEN MOLDED RUBBER KNEE PADS

- TOUGH MOLDED RUBBER
- SOFT SPONGE INSERT
- ADJUSTABLE STRAPS
- NON-SLIP WAFFLE TREAD
- MOISTURE RESISTANT
- LIGHT IN WEIGHT

Can you afford to let your workers suffer, disabling knee ailments and injuries when they can be "knee deep" in the protection of JUDSEN KNEE PADS? The safety of JUDSEN KNEE PADS is proved by thousands of workers who enthusiastically use them to work long hours on rough, hard or damp surfaces. Workers can wear them all day long—kneeling, standing, or walking. They're the safest, longest wearing, most comfortable knee pads available!

Avoid the many hazards of unprotected knees—make a profitable investment in knee safety that will pay off in more efficient work and *LESS TIME LOST.*

ORDER TODAY from your jobber or write direct.

Made by
JUDSEN RUBBER WORKS, INC.
Chicago 24, Illinois

Established 1890

12 REASONS WHY HY-TEST is your best Safety Shoe buy!

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10 TOUG BOX TOE PROTEC VAMP LI

11 ISCO-N VAMP LININ

12 AUSTEMPE ANCHOR FL STEEL BO TOE

FULL RANGE OF SIZES, TYPES AND STYLES FOR EVERY SAFETY NEED

- 50 DIFFERENT TYPES
- 9 DIFFERENT KINDS OF SOLES
- WIDTHS AA-EEE, SIZES 5-15
- 5 LASTS (Dress & Work)
- WELT AND NAILED CONSTRUCTION

HY-TEST SAFETY SHOES

HY-TEST DIV. • INTERNATIONAL SHOE COMPANY • ST LOUIS 3, MO. • EASTERN OFFICE • MANCHESTER, N. H.

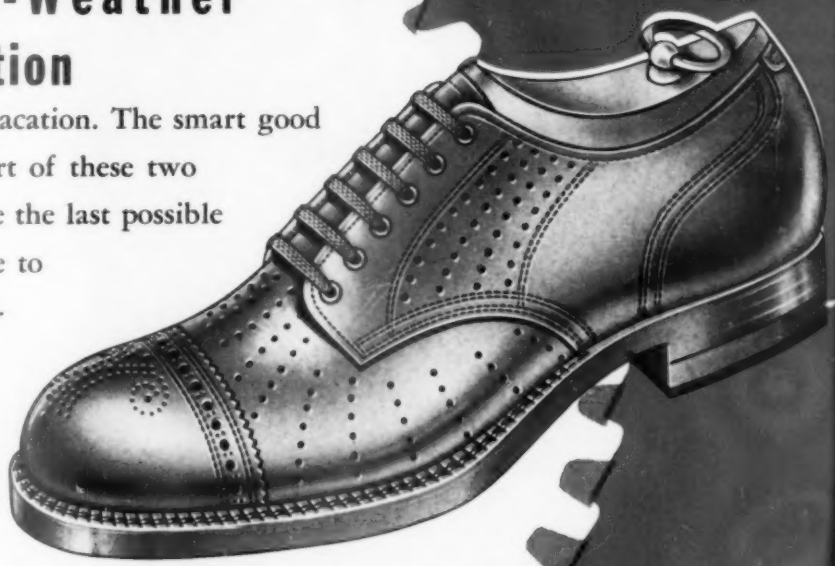
There's NO CLOSED SEASON ON TOE ACCIDENTS

H719 — Men's Brown Side woven blucher Oxford. Weather-wear sole, half-rubber heel. Widths A to E, sizes to 13.

HY-TEST'S Warm-Weather Foot-Protection

Accidents don't take a summer vacation. The smart good looks and air-conditioned comfort of these two popular Hy-Test numbers remove the last possible objections your workers can have to safety toe protection in the warm-weather months ahead.

WRITE FOR FREE CATALOG



H712X2 — Men's Brown Kip ventilated blucher Oxford. Leather sole, half-rubber heel. Widths B to EEE, sizes to 12.

. . . Insure Workers' Feet in Sure Protection

with

HY-TEST ANCHOR FLANGE SAFETY SHOES

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST DIV: INTERNATIONAL SHOE COMPANY • SAINT LOUIS 3, MISSOURI

NEW YORK OFFICE: 225 W. 34TH ST. • EASTERN OFFICE: MANCHESTER, N. H.

HY-TEST SAFETY SHOES

Shock absorbers incorporated in harness and lanyards reduce the severity of impact. This decreases both the possibility of injury to the wearer and failure of the equipment.

Quick release from a safety belt may be desirable in case of fire. Petroleum workers, for instance, use belts with a quick release buckle which can be disengaged instantly by a single motion of the hand.

Belts for some occupations contain loops and pockets for light tools. Collapsible canvas tool buckets are also needed on some jobs so the worker may have his hands free while climbing. Guards should be used for edge tools.

Impro[illegible] material for lanyards may be available in the future. A special nylon material, known as Unolyn, has shown remarkable ability for absorbing impact force. It elongates with constant resistance up to five times the original length. At maximum elongation, it has 75 per cent greater breaking strength than the draw load required to stretch it. Unolyn is now available commercially.

Care of Belts

Dirt should be brushed off carefully so as not to scratch the belt. A leather belt should then be washed with warm water and saddle soap or castile soap. It should be rinsed in clean warm water and allowed to dry in room temperature.

Safe harness and life lines are worn by men working on the steep hill sides on a dam construction project (U. S. Engineers).

Leather belts should be treated with neatsfoot, castor, soybean or a compound oil, to prevent drying out, not a mineral oil. A leather belt should never be exposed to excessive heat.

Cotton or linen webbing belts may be washed in soapy water, rinsed and dried by moderate heat. They are not damaged by any temperature up to the boiling point of water. The manufacturer of the belt should be consulted about the dressing.

Life belts should be inspected before use by the employees wearing them. Every one to three months they should be carefully inspected by a trained individual.

Leather belts especially must be watched carefully for cuts or scratches on the skin side of the hide. A deep cut on the skin side warrants condemning the belt.

Fabric belts should not be used if the outer plies are cut or worn through. All belt hardware should be checked and replaced if it shows signs of wear. If the belt is riveted, each rivet should be examined separately.

Tail lines and life lines should be washed with mild soap and water and dried in circulating air. They should not be exposed to high temperatures. Rope should be kept in open coils and never bent sharply.

ANOTHER STA-SAFE PRODUCT

Three LEADERS in Safety Fabrics

— each with a job to do — each designed for the most in protection, comfort and economy.

GRA-LITE MAROON AIR-LITE

These three leaders in protection—the new Gra-Lite with unequalled chemical resistance, Maroon Fabric for utmost protection in neoprene compounds, and Air-Lite where plastic films are required—*all* are available in a wide variety of styles and sizes in *both* garments and aprons. Feel free to discuss with us your problems in chemical protection—a well staffed development and design department is open for consultation without charge.

Write today for a free swatch and these bulletins:

Gra-Lite ..... Bulletin No. 255
Maroon Fabric ..... Bulletin No. 256
Air-Lite ..... Bulletin No. 257

STANDARD SAFETY EQUIPMENT COMPANY
232 W. ONTARIO · CHICAGO, ILLINOIS

Respiratory

(From page 71)

ure of the air supply required him to remove the respirator.

This respirator differs from the hose mask mainly in two features: It has a hand-operated, quickly detachable coupling connected to the belt or body harness so that the operator can connect onto a compressed air hose, also a flow-limiting device with capacity to permit air flows only between 2 and 20 cubic feet per minute.

Section 2—Personal Protection

STAY ON THE JOB

with

MOXSAN FINGER PROTECTORS

Moxsan protects not only the front of fingers, but *both sides* with durable leather that's seamless on all wearing surfaces. Elastic web back provides cool, comfortable fit. Tapered cut gives freedom of movement. Essential for handling rough or sharp articles, for buffing, grinding, sanding, polishing, punch press work and hundreds of other jobs. Fits all fingers. Available in 3 types of leather for men and women: heavy duty (7394), medium duty (8384), fine work (9346).

Send 10c for sample or $6.48 for a box of 72 . . . today!

FREE Special circular illustrating full line of finger protectors and illustrated catalog of safety work gloves and safety apparel sent to business organizations on request.

OLYMPIC GLOVE COMPANY Inc.
95 Madison Ave., Dept. 15, New York 16, N. Y.

BETTER PROTECTION AT LOWER COST

. . . with KENNEDY INDUSTRIAL APRONS

The best in clear, pliable, "Vinylite" plastic aprons. Excellent for use with oils, acids, water, and abrasions. Long lasting and serviceable, these aprons are ideal for many shop and laboratory jobs when corrosive materials are in use.

Also available, a tough Neoprene-coated apron for long service.

Write Dept. NS for full information on all other materials in all styles.

V. E. KENNEDY CO.
5004 W. BURLEIGH STREET
MILWAUKEE 10, WISCONSIN

A trap and filter installed in the compressed air line ahead of the masks to separate oil, water, scale, or other extraneous matter from the air stream is desirable.

An air-pressure regulator in the line is required if air is supplied at a pressure in excess of 25 pounds per square inch and, in addition, a pressure release valve which will operate if the regulator fails.

The air-line respirator is the most desirable protection for operations requiring continuous use of a respirator. Other types of respirators may give adequate protection, but they offer a breathing resistance not present in the supplied-air type and are consequently more fatiguing.

To obtain clean air, the compressor intake must be kept away from all sources of contamination. The compressor should be well maintained and must not run too hot, as dangerous amounts of carbon monoxide can be produced by decomposition of lubricating oil.

Air delivered to the mask should be of a comfortable temperature and humidity. Compression and re-expansion often produce a temperature and humidity widely different from that of the air entering the compressor. Air supply going to the respirator should be conditioned automatically.

Abrasive Blasting

Abrasive blasting requires not only an adequate supply of filtered air, but also mechanical protection for the head and neck. This protection can be supplied either by an impregnated cloth hood or by a helmet of some rigid material. It should be covered both inside and outside with a plastic material, such as soft rubber, to increase both comfort of wearer and resistance to abrasive.

A window of transparent material, suitable for optical use, protected from the abrasive by a 30- to 40-mesh fine wire screen should be provided. Both window and protective screen should be readily replaceable.

Self-Contained Apparatus

When it is necessary to work in atmospheres immediately hazardous to life at distances from the source of fresh air greater than the 150 feet provided by a hose mask, self-contained oxygen breathing apparatus may be used.

Most oxygen-breathing apparatus carries its oxygen in cylinders. One type has a small canister containing a chemical. Moisture from the breath starts a chemical reaction which liberates oxygen.

Corrosive atmosphere. Equipment for rescue work or emergency repair work must provide adequate protection for an atmosphere which is ex-

—To page 118

SECO . . . The Great Improvement In Work Gloves

Here is a revolutionary new work glove . . . SECO. High quality cotton fabric is coated with an Arcadia-Processed synthetic.* Result . . .

SECO MEANS:

SAFETY—in a wide variety of uses;

ECONOMY—the coating l-a-s-t-s;

COMFORT—flexibility with finger freedom;

OK'D by Industry—proved in test and in operation.

Not an experiment. There are already hundreds of industries saving important money because the Seco Arcadia-Processed coating just doesn't wear out. Can Seco gloves outwear the kind you are now buying 5 to 10 times? It's being done!

Seeing Secos is Believing

Write us; we will get a sample to you.

Seco Work Gloves are available in the following models: Knit Wrist, Gauntlet, Band-top, and Open Back.

Seco is the registered trademark of Seco Safety Products Company.

*The coating is a process of Arcadia Manufacturing Co. Birmingham, Michigan

SECO SAFETY PRODUCTS CO.
1437 Brooklyn • Detroit 26, Michigan

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ADVANCE
TIGER GRIP

OUTWEARS
SEVERAL PAIRS OF ORDINARY GLOVES!

TIGER GRIP is the glove that has proven its true worth on the job. It gives the worker greater protection because its specially knitted material contains hundreds of "loops" that cushion the hand. Soft and comfortable—cool in summer, warm in winter. By actual test it OUTWEARS several pairs of ordinary woven fabric gloves.

"A BETTER WORK GLOVE FOR EVERY PURPOSE"

NO. 2396A—STEEL REINFORCED LEATHER GAUNTLET

Maximum protection plus long service. Chrome tanned cowhide of uniform thickness throughout. Reinforced with ribbons of durable steel. Entire glove securely sewn throughout with steel wire.

ADVANCE manufactures a complete line of cotton and leather gloves, welders gloves, wire-stitched gloves—a complete line of safety and protective clothing for every industry.

Write for complete 32 page **CATALOG**

ADVANCE
GLOVE MANUFACTURING CO.
DEPT. NS, 901 W. LAFAYETTE BLVD.
DETROIT 26, MICH.
Detroit • Toledo • Chicago • Rome, Ga.

Workers Everywhere keep cool with KOOLPADS

StaSafe Koolpads are a feather weight, ventilated, sweat band made of reinforced cellulose sponge. Dampened and worn on the forehead, their cooling effect helps maintain worker efficiency. Koolpads are a must for workers wearing glasses or goggles because they prevent sweat from running down over lenses.

Adjustable to any required head size and exceedingly comfortable to wear. They may be washed out repeatedly.

WRITE FOR BULLETIN No. 260

STANDARD SAFETY
EQUIPMENT COMPANY
232 W. ONTARIO • CHICAGO, ILLINOIS

10 TIMES HIGHER ABRASION RESISTANCE . . .
standard abrasive wheel test

4 TIMES HIGHER SNAG RESISTANCE . . .
standard needle test

MUCH HIGHER CHEMICAL RESISTANCE . . .
standard strip immersion tests
. . . than natural rubber or standard synthetics

SURETY SURESEAL SYNTHETIC RUBBER GLOVES

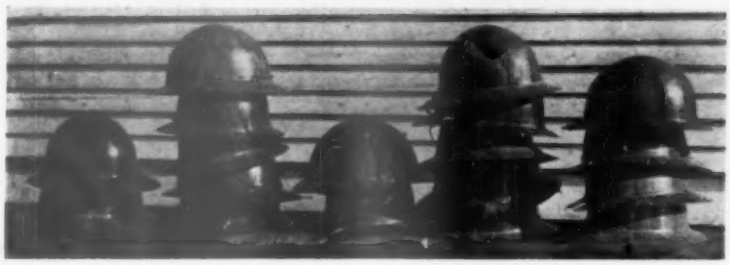
ADD UP TO SAFER HANDS, LONGER WEAR, LOWER HAND PROTECTION COSTS.

THE SURETY RUBBER CO. CARROLLTON, OHIO

Ask for Surety's unique Glove Selector, the quick guide to the right glove material for your operations. Dept. S

At The Greater New York Safety Show — Booth 60

HEAD PROTECTION



Every hat here saved a head from serious injury.

THE PROTECTIVE hat is a necessary item of equipment in occupations where the head is menaced by falling objects or bumps against overhead structures.

Among the large users of these hats are the mining, lumbering, construction, shipbuilding and petroleum industries.

In addition to protecting against impact, the hats must be fire-resistant and impervious to moisture. If contact with electrical equipment is possible, they should be non-conductive.

Types and materials. A hat with a brim all the way around provides the most complete protection for the head, face and back of neck. For confined spaces where a brim might be in the way, the cap type may offer adequate protection.

A widely used material is laminated plastic molded under high pressure. It is resistant to impact and to the effects of water and oil. It has high dielectric strength.

A recently introduced material is glass fiber impregnated with resin. It has a high strength-weight ratio, high dielectric strength and resistance to moisture. A special hat with phosphorescent pigment which glows in the dark is available on special order.

Metal hats of light weight aluminum alloy meet all requirements of impact resistance. However, they should not be used where there is possibility of electrical contact.

The hard outer shell of the hat is supported by a cradle or hammock which keeps the shell away from the head and cushions it against blows.

Cradle and sweatband should be replaceable because of deterioration when exposed to perspiration for long periods. This is also important for sanitary reasons, especially when the hat is worn by more than one person. The shell can be sterilized by any of the common methods.

A weight of not more than 14½ ounces for the complete hat is specified by the Federal Treasury Department, Procurement Division, in Specification No. 367A. The specification also lists several tests which approved hats must pass. These include tests for resistance to moisture, impact and electricity.

Protective hats are furnished with brackets to support welding masks or miners' cap lamps.

For cold weather a winter lining may be attached to the hat. This lining is made of water-resistant cloth to protect head, neck and ears.

Where the wearer may be exposed to strong winds on such locations as bridges and oil derricks, the chin strap is a useful accessory.

An eyeshield of transparent plastic can be attached to some types of hats. It is hinged under the peak and lies flat against the peak when not in use.

Colors. Brown, gray and white are standard colors with most manufacturers. Red, green and several other colors on special order are offered in some types.

Hard hats are frequently painted different colors and designs to designate the wearer's department or trade.

Hair Protection

Woman's hair has always been a problem around moving machinery. Scalping injuries are likely to occur at points where the hair may come in contact with moving shafts, belts, pulleys and the like, or where enough static is produced by the machine to lift the hair.

Covering the machine may suffice in some operations but women who work around such machinery should wear caps which completely cover the hair. Hair covering is desirable also in the interest of cleanliness.

Hair coverings should be made of a fabric sufficiently durable to withstand regular laundering and disinfecting by commercial methods. Design should be simple so that pressing or ironing may be done by machine.

Caps should be provided in a sufficient variety of head sizes, or with a sufficient range of adjustment in the head size to fit all persons.

Flame-resistant material should be specified when used near sparks or flame. Caps should be provided with a stiff brim long enough and rigid enough to provide some warning before the head comes in actual contact with a moving object.

Hair nets or turbans, which are preferred by many women, are not considered sufficient protection around moving machinery.

Ear Protection

Against Noise. In boiler shops, on construction jobs, operation of pneumatic hammers, etc., excessive noise may cause fatigue and distraction.

Reducing noise levels at the source is not always practicable. For such jobs, ear plugs, or stopples, of correct design have reduced the sound level by 35 to 45 decibels. Ordinary conversation can be carried on while wearing them.

Ear stopples of soft rubber and plastic are available in small, medium and large sizes. They should be cleaned daily, and sterilized if transferred to another worker.

Common types of work gloves for protection against abrasion, heat and chemicals.

Here's what's stacking up new

1611 MOCCASIN STYLE OXFORD

1615 AIRY, WOVEN OXFORD

702 WOMEN'S MOCCASIN STYLE
Smart, comfortable, SAFE, with a new lower heel that most women like.

Just two of Lehigh's famous EXECUTIVES that make **one** pair do the work of *two!*

FIRST: ***the shoes*—43 different styles for almost every industrial need, including the famous Lehigh "Executives" that are being taken up by tens of thousands of men who *never would wear a heavy work shoe!*** **SECOND:** **Lehigh's complete *Safety Service*—FREE posters, pay envelope stuffers, safety lectures, fitting aids . . . everything you need to induce the employee to buy! Lehigh can help you hang up a new foot safety record in *your* plant . . . make huge savings in compensation costs and lost time as they have in thousands of others. Want it? Write us.**

FOOT SAFETY RECORDS

1310 ATHLETIC TYPE WORK SHOE
Greater flexibility and comfort; rugged "OIL-FIGHTER" sole.

1327 MEDIUM WEIGHT WORK SHOE
One of our best-selling styles for general industrial service.

See us!

BOOTH No. 16 NEW YORK SAFETY SHOW
HOTEL STATLER • MARCH 28 to 31

LEHIGH
Division of the ENDICOTT JOHNSON CORPORATION
SAFETY SHOE COMPANY
ALLENTOWN, PA.

Just off the press:

SEND TODAY for your copy of new Lehigh Catalog No. 15 showing dozens of improved safety shoes and boots; listing all selling aids. **IT'S FREE.**

Industrial and SAFETY FOOTWEAR

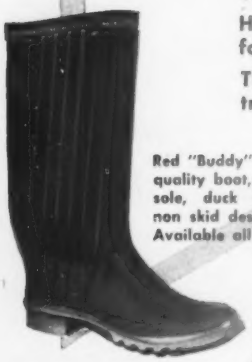
Bar-flex boot — Patented outside arch and heel, for comfort and traction, "cushion" insole. Made both regular and with molded neoprene non-skid outsoles. Black uppers.

TOP NOTCH *Steel* SAFETY TOE CAP

Tested to withstand 2000 lbs. pressure!

Here is genuine tested protection against toe injuries — the most common foot hazard to a worker!

There is a "Top Notch" Waterproof Footwear item to fill every industrial requirement. Many styles feature the Steel Safety Toe Cap.



Red "Buddy" — superior quality boot, cushion insole, duck lined, grey non skid design outsole. Available all heights.

10" Black Pac for the miner and industrial worker, both snugfit and lace type. Cushion insole, gray non skid design outsole, steel toe.

6" all rubber shoe following the general features and comfort of a leather work shoe. Special last, non skid design outsole and heel, cushion insole. Regular or steel toe.

TOP NOTCH INDUSTRIAL BEACON FALLS CONN.

TOP NOTCH Buddy BEACON FALLS CONN.

THE FINEST INDUSTRIAL RUBBER FOOTWEAR IS IDENTIFIED BY THESE LABELS

MANUFACTURED BY

BEACON FALLS RUBBER FOOTWEAR

Beacon Falls, Connecticut

191 Hudson Street
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The Merchandise Mart
Room 350, Chicago 54, Illinois

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Minneapolis, Minn.

NEO CORD

The outstanding industrial sole. Stout cords combined with DuPont Neoprene form this sole that resists deterioration from oil, grease, acids and caustics. Its slip resistant quality lasts the entire long wear life of the sole.

NEO CORK

IT'S NEW . . . IT'S SENSATIONAL! The successful blending of neoprene and cork makes this sole tops in long wear and slip resistance. Resists oil, grease, acids, caustics. Insulates the feet against heat or cold, and is shock absorbing.

OIL RESISTANT

Mr. Safety Engineer, you can depend upon these soles to reduce accidents caused by slipping.

GRO CORK SOLES

Tough natural rubber impregnated with cork. Won't pick up metal chips, outwears leather, is waterproof, and insulates feet against heat or cold. Best for steel riggers, rock quarries, shipyards, foundries, creameries, and metal cutting departments.

TRADE GRO CORD MARK
CORD-ON-END

Actual tests prove Gro-Cord Soles will outwear at least two leather soles. Cord-on-end construction with natural rubber makes these soles slip resistant, waterproof and comfortable. Ideal for yard men, constantly wet floors, loading docks, etc.

GRO-CORD RUBBER CO., LIMA, OHIO

Canadian Plant

GRO-CORD RUBBER CO., TILLSONBURG, ONT.

A NEW FIRST by Cambridge

Rugged OIL-RESISTANCE plus Flexible Cushioning Comfort

. . . the GREATEST advance in WORK SHOE SOLES since the invention of NEOPRENE

Vul-Cork
OIL RESISTING
NEOPRENE

It's easier to SELL YOUR SHOES when workers see the famous name VUL-CORK

GENUINE NEOPRENE OIL-RESISTANCE

plus

NEW amazing Air-Cell Processed LIGHT-WEIGHT f-l-e-x-i-b-i-l-i-t-y and Cushioning Comfort

NEW Air-Cell INSULATION. Cool on Hot Footing. DO NOT CRACK in extreme cold

NEW surefooted SLIP-RESISTANCE without need of Tread Design

NEW long-wearing Trim Edge Appearance for dressy wear anywhere . . . Do not pick up steel scraps, chips, etc.

Regular Vul-Cork FLOATING POWER Soles are unique for rugged — *yet flexible* — ALL-PURPOSE work wear . . . on farms . . . construction . . . delivery . . . filling stations, etc. — everywhere except where excessive oily underfooting requires Neoprene.

THE Cambridge RUBBER COMPANY

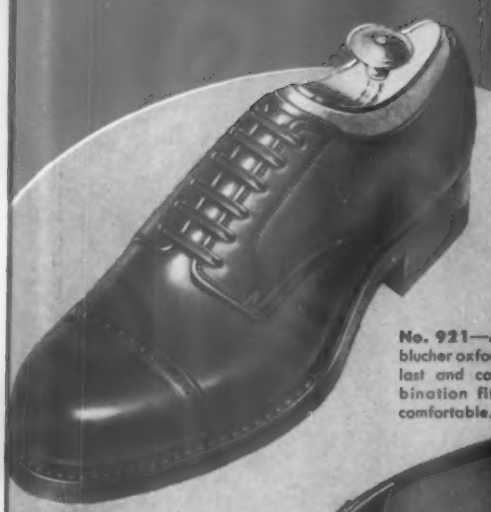
VUL-CORK SOLE DIVISION TANEYTOWN MARYLAND

YOU CAN'T BEAT

THESE DISTINCTIVE **Iron Age** STYLES

FOR

COMFORT AND VALUE



No. 921—A brown dress blucher oxford. SAFTOPEDIC last and construction, combination fit. Lightweight, comfortable.

No. 600—The Hi-Lo safety shoe in rich cordovan brown. Gives the freedom of an oxford with the support and protection of a high shoe.

No. 618—A comfortable, stylish moccasin oxford in colorful burgundy elk. Has long wearing "Leatherplus" outsoles, rubber heels.

No. 698—A black elk blucher with two full leather soles, rubber heels. Outsole is "Leatherplus". An outstanding value in a conventional work shoe.

No. 683—A brown elk lace-to-toe blucher with "Neo-Cord" sole and heel. Comfortable, flexible, long wearing.

Boost Your Coverage with the five latest Iron Age styles pictured here. Just stock and display these value leaders. Then watch how even the "die-hards" to the safety shoe idea will be swayed by their purchase-impelling appearance and quality features. Experienced Iron Age representatives are located in all industrial areas. There's one near you. Write us and we will have him show you the complete line and fully explain the many advantages of stocking Iron Age Safety Shoes.

Iron Age Division, H. Childs & Co., Inc., Pittsburgh 22, Pa.

Iron Age **SAFETY SHOES**

PITTSBURGH 22, PA.

Iron Age

The Safety Shoe

Foot Protection

(From page 72)

Where the hazard to the feet is serious, the added protection outweighs the objection that foot guards slow down the wearer's movements.

Distribution

To secure acceptance of the foot protection program, safety shoes must be comfortable and properly fitted. Purchasing must also be made convenient.

Many of the larger companies maintain well equipped stores with a wide range of lasts and sizes and trained attendants to fit the shoes. Shoes are sold at or sometimes below cost and employees may buy them on the payroll deduction plan.

Smaller plants are not always in a position to stock an adequate range of sizes or provide expert fitting service. Many companies have made arrangements with local shoe dealers whereby employees may select shoes and pay through payroll deduction.

In some areas a mobile shoe service is offered by dealers. A truck equipped as a shoe store is manned by an experienced fitter who is responsible for all adjustments. A variety of styles and a full range of sizes is carried. Periodic visits are arranged and between visits shoes can be obtained quickly on special order.

This service is rendered on a moderate mark-up basis and the plant can charge the employee any part of the cost.

Leg Protection

Protection for the legs may vary from waist-length leggings to spats. For many operations, the extra protection of the longer types is desirable.

Materials are the same as those used for body garments: 1. Asbestos for protection against molten metal, heat and sparks; 2. Chrome-tanned leather for less severe exposure to splashes and heavy sparks; 3. Fireproofed duck to ward off light splashes or sparks.

Rubber, both natural and synthetic, and plastic are serviceable for leggings in work with acids, alkalis and hot water.

Workers who use axes, adzes and similar tools or handle heavy materials can be protected by shin guards of lightweight alloys or fiber.

Men who work with molten metal use leggings designed so that they can be removed instantly in an emergency. The leggings have flares to protect the instep, and should be free

ENGINEERED FOR SPECIAL JOBS

NEW! BAR-FLEX BOOTS reduce hazards and fatigue.
- Exclusive Bar-flex sole.
- Anti-slip traction cleats.
- Plain or steel toe which resists 2000 lbs. pressure.
- Shockproof sponge insole.
- Tough multi-ply leg.
- Tempered rubber OR Neoprene rubber to resist oils, chemicals, acids.

US ROYAL FOOTWEAR

BAR-FLEX SOLE
Solid shank support and standing comfort under length of your feet.

U. S. ROYAL WORK SHOE
Anti-skid, cleated sole; shockproof sponge insole; waterproof bellows tongue.

WHITE DAIRY BOOT
10" high has cleated anti-slip sole, and shockproof insole. Adjustable strap. Plain toe; steel toe.

TERRE HAUTE PAC is a fine general industry boot. Shockproof sponge insole. Plain toe has tire-tread sole. Steel toe has cleated sole.

NEW FLEXON PAC WITH STEEL TOE
Easy vamp; snug-leg fit at ankle; leakproof tongue; cleated-type sole and heel.

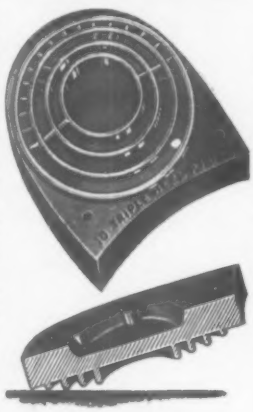
HIGH-CUT FLEXON
S-t-r-e-t-c-h-e-s on over shoes. Tire tread soles. Tough, tempered rubber.

Also a complete line of Raynster Work Clothing and Sundries

UNITED STATES RUBBER COMPANY
Rockefeller Center, New York

NON-SKID SAFETY

SHOCK ABSORBING LONGER WEAR



The Triple Safety Heel was designed to minimize foot slipping accidents. It has a tread design of circular ribs with connecting cross bars that causes suction. In walking it gives road contact of one inch, where ordinary heels contact only on the edge. Laboratory tests show Triple Safety Heel has 97% road contact and traction.

Design permits rubber to flex, absorbing body shocks, minimizing fatigue. Triple Safety Heels will give longer wear and reduce slipping accidents on wet or slippery floors.

WRITE FOR CIRCULAR

TRIPLE SAFETY HEEL CO.
2149 Leland Avenue Chicago 25, Ill.

Your men wear these Safety Shoes willingly!

S-4130—Brown elk with long wearing oil resistant sole and heel. Tapered top for maximum easy-walking comfort.

S-1010—Black work elk with leather sole and rubber heel. Also with oil resistant sole and heel. Both also in oxford type.

S-4250—Dress oxford in chestnut brown with leather sole and heel. Similar types in brown, cordovan color or black.

S-4355—Woven moccasin type in chestnut brown with leather sole and rubber heel. Three similar moccasin types also available.

Why this greater acceptability for Thom McAn Safety Shoes? Because men *know* the Thom McAn name—more men wear Thom McAns than any other shoe! They *know* Thom McAn means extra good looks . . . all-day foot comfort . . . more mileage for their money. And the rugged safety features mean protection-plus.

No wonder men want the familiar Thom McAn name on their on-the-job shoes! And remember: when men wear safety shoes willingly—they wear them every day. And *that's* what keeps safety records safe!

Visit Thom McAn at Booth No. 78
Greater New York Safety Council Show

SOLD 2 WAYS

1. Stocked for your men in Thom McAn stores.
2. Sold direct to plants.

Details of this service, plus information on the 4-way employee purchase plan, and the Thom McAn safety shoe features, should all be on your desk. Just write us and we'll see that they get there.

THOM McAN SAFETY SHOE DIVISION
25 West 43rd Street, New York 18, N. Y.

Thom McAn
SAFETY SHOES

A DIVISION OF MELVILLE SHOE CORPORATION

Prevent Falls

"and slipped and fell when he stepped on the slick spot. His head struck a..."

Keep Production up...on its feet!

Falls top the list of personal injury causes, so **for safety's sake** keep your workers on their feet with TIGERFOOT, the no-slide, no-slip safety tread for shoes or boots. Designed by experts in the field of accident prevention, TIGERFOOT is ideal on slippery-wet, greasy or icy floors, ramps, platforms and scaffolds, on snow-glazed walks and yards. Instantly fitted over any footwear, with 3 sizes, (small, medium and large) they are easy to wear, comfortable to walk on and prevent accidents that are **costly, serious, painful.**

TIGERFOOT

New Products Development Corp.
2080 Grand Blvd.
Schenectady, N. Y.

Please send trial pair of TIGERFOOT (size)_____
Our slipping hazard is caused by_____
Firm_____
Street_____
City_____ State_____
Attn: Mr.:_____

Leggings and spats of asbestos or leather protect against heat, sparks and splashes of molten metal.

from projecting buckles and clasps.

When new, chrome leather is vulnerable to molten metal and sparks. One manufacturer recommends that the operator keep out of the line of fire until his garment has become "broken in." He will find that it will last many times longer.

Special protection against unusual hazards is needed for some jobs. For example, protection against poisonous snakes is needed by construction, petroleum and public utility workers in infested areas. For these men, fiber leggings of the spring-knee type have been developed. Protection against long wet grass is provided by a covering of waterproofed duck.

What the Worker Really Thinks

Does the factory worker think his company is doing a good job in eliminating accident hazards on the job?

According to an article in Factory Management and Maintenance for November, 1949, the workers in several groups give management credit for conscientious and effective effort. Following is a summary of the workers' opinions:

How about your particular job? Do you think it is a fairly safe or a pretty dangerous job?: "Safe" 86 per cent, "Dangerous" 13 per cent, "Don't Know" 1 per cent.

Would you say your company has done everything it should to help prevent accidents on the job?: "Yes" 83 per cent, "No" 11 per cent, "Don't Know" 6 per cent.

The outstanding characteristics of the replies to all six questions is the lack of extreme variation of the replies of the several worker groups.

Age has no influence on the worker's opinion of his company as a safe place to work.

While the opinions are favorable in most cases, there is a real challenge for management to re-appraise and improve the safety program. When it comes to safety, anything less than 100 per cent really isn't safe.

HERE'S LOW COST FOOT PROTECTION!

STASAFE
TOE CLIPS

Fits any square toed shoe. Designed for permanent attachment or intermittent wear.

These heavy gauge metal caps reinforced for greater resistance to impact can be worn by any worker who can wear shoes. Low Priced Toe Clips make foot and toe protection possible for all workers.

TOE CLIPS
OFFER
PROTECTION
COMFORT
LOW PRICE

WRITE FOR BULLETIN NO. 262

STANDARD SAFETY
EQUIPMENT COMPANY
1232 W ONTARIO · CHICAGO, ILLINOIS

How to get more of your employees to wear safety shoes...

Offer SENTRY Shoes built exclusively for industry . . . specially designed for:

1274 — Black oil with Steel Safety Toe. Nonskid, oil, heat and acid resistant Neoprene "Neo-Cord" sole and heel.

More Comfort

Your employees will enjoy wearing Sentry Safety styles because these protective shoes are more comfortable. Sentry Shoes are lighter in overall weight yet they give full protection against toe injuries and provide a workman with "dress shoe fit" and greater foot ease from the moment he puts them on. Made exclusively for industry, Sentry Shoes are designed with a box toe of cold austempered steel fitted between a rugged leather outside cap and a one-piece leather vamp extending entirely under the steel toe.

1183—Brown oil with Steel Safety Toe. Nonskid "Vul-Cork" sole. Rubber heel.

Smarter Appearance

Styled for smarter appearance, all the handsome Sentry Shoe models hide their safety features from public view. You'd never guess the steel safety toe was anchored between those sturdy, pliant leathers to guard every step, hour after hour and day by day throughout longer wear. You have only to promote and display Sentry Safety styles. Your employees will *prefer* to wear them.

Better Service

You don't have to carry a burdensome inventory of Sentry Safety Shoes to make them available to all your employees. We keep on hand an adequate stock of a wide variety of styles to supply your needs at all times. By ordering from our in-stock service you can keep your employees supplied with these fine shoes. Our Safety Engineer is available to advise with you on your specific problems. Write today for our style catalog and the complete Sentry proposition.

1139 — Brown retan with Steel Safety Toe. Nonskid "Vul-Cork" sole and heel.

SENTRY SHOE COMPANY

Manufacturers of safety shoes exclusively for industry

119 SEVENTH AVE., N. • NASHVILLE, TENN.

A DIV. OF GENERAL SHOE CORPORATION

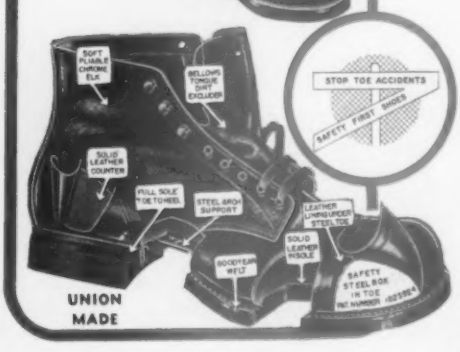
Unlined Double Sole Work Shoe

For the want of a Safety Shoe . . .

Lined Semi-Dress Blucher

"Dressteel" Oxford for Street or Shop

Congress Style Molder's Shoe



more than production time is lost!

Just one foot accident in your plant today could cut deep into your profits tomorrow. Enjoy the peace of mind that comes with knowing that Safety First Shoes are protecting your employees . . . protecting your profits.

As pioneer manufacturers of safety shoes for men, we can help you practically eliminate costly foot accidents. More than a steel toe shoe — each Safety First Shoe is constructed to combat a *specific* foot hazard. Get the facts today.

FREE *Safety Posters to Help You Prevent Costly Foot Accidents!*

Safety First

SHOE COMPANY

HOLLISTON 3, MASSACHUSETTS

WEST COAST SAFETY ENGINEERS: Complete stocks also maintained at Safety First Shoe Company, Pacific Bldg., 16th St., Oakland, Cal.

I KNOW I'M SAFE... with WOODEN SOLES!

- HEAT RESISTANT
- THICK BUT LIGHTWEIGHT
- STRONG STEEL TOE

No. 300—The Reece "Hot Foot" sandals protect your feet in furnace and foundry rooms. Straps on over your own shoes. Heat resistant wooden soles, strong galvanized iron counter, flexible hinge toe. Cannot slip.

Also No. 560—Tractor Tread Wooden Sole . . . provides great flexibility . . . straps on over any shoe.

Sizes — Small, Medium and Large

No. 504-S—Reece All-Purpose Shoe with soft, flexible leather uppers, steel toe, Reece "PERFECT ROCKER" Wooden Sole. Safe, reliable, dependable for factories, platers, oil refineries, foundries, steel mills. Also other styles.

Sizes—5-13. No half sizes.

...FOR THE FOUNDRY

No. 600—HIGH TOP PROTECTION—10-inch neat fitting boot laces up closely, providing protection against heat, water, steam and oil. Full bellows tongue, large eyelets, guaranteed counter, durable retan leather uppers. REECE "PERFECT ROCKER" WOODEN SOLE.

May be had with STEEL TOE.

Reece Orthopedic Shoe

for

BROKEN FOOT BONES
CRUSHED TOES
SWOLLEN FEET

No. x175-CG—Men's
No. x173-CG—Women's

SMOOTHLY finished WOOD SOLE with AIRFOAM insole acts as splint. Keeps injured foot immobile.

Keeps a man on his feet and on the job. Cool, firm but lightweight canvas, upper laces entire length . . . makes for perfect fitting even though heavily bandaged.
Sizes—Small, Medium, Large.

FOR THE FACTORY...

No. 511—OIL REFINERY SHOE. Heat and Oil-resisting leather uppers, "Perfect Rocker" Wood Sole. Popular price shoe. Sizes 3-13.

With or without **Silencers**
Full run of sizes eliminates guessing . . . insures perfect fit.
Men's—6-13 Boys'—1-5
Women's—3-9
no half sizes.

SHOWER SANDALS

Reece "Platform Rocker" wooden soles made of selected hardwood . . . satin smooth . . . light weight . . . E. Z. Walking.

Plain or colorful straps attached with rustproof nails.

Also other styles.

No. 180—Platform Rocker
No. 809—"Perfect Rocker"
Safety Heel strap extra.

Write for Catalog

BE SAFE —
WEAR A REECE WOODEN SOLE

REECE WOODEN SOLE SHOE CO.

There is no substitute for Reece Wooden soles

DEPT. NS-3 **COLUMBUS, NEBRASKA**

Respiratory

(From page 103)

tremely corrosive to the skin and mucous membranes and is also acutely poisonous, or immediately hazardous to life.

For these conditions a complete suit of impervious clothing, plus breathing equipment, must be provided. Complete suits of rubber, synthetic rubber or plastic with helmets and attachments for hose lines are available.

Material should be specified with sufficient mechanical strength to withstand rough handling. Hose line connections should be made to the suit itself, as well as to the helmet, since the wearing of such an impervious suit for a long period is not only fatiguing but actually dangerous unless well-ventilated.

Care of Equipment

Respiratory devices should be stored in a clean, cool dry place to retard deterioration of rubber parts.

All parts, with the exception of canisters and cartridges, should be cleaned after each use. Face pieces and air lines or hoses may be washed with soap and water, rinsed in clean water, and dried.

Filters should be replaced when clogged and used ones discarded. Canisters and respirators should be replaced at regular intervals as recommended by the Bureau of Mines. Even when not used they lose their effectiveness with time.

All respiratory devices should be sterilized before being passed from employee to employee. They should withstand sterilization by immersion for not less than 10 minutes in 40 per cent formaldehyde solution diluted with nine times its own volume of water; boiling for at least five minutes, or by exposure for not less than 10 minutes in a moist antiseptic vapor, such as formaldehyde.

It is generally not practicable to sterilize head bands, at least not the elastic bands, but they may be washed with soap and water. Bands should be replaced when the respirator is transferred to another user.

A central station for care and maintenance should be set up when a large number of respirators are in regular use. Such a unit also is suitable for the care and maintenance of other items of personal protective equipment.

Each employee should be provided with two respirators and either a locker or a hook at the central station. Respirators should be branded or tagged with a number to indicate to whom they are assigned.

The identification should be per-

Are You Fully Protecting the Feet of Your Employees?

"SANKEY" IMPROVED FOOT GUARD equipped with Anti Skid TOE CLIP.

"SANKEY" FOOT GUARDS consist essentially of a metal shield to be worn over the shoe whenever the foot is in danger of being either crushed or cut. The metal shield is designed to furnish a maximum amount of protection to the entire front of the foot—not merely the toes alone, but also to the instep against hazards from falling, rolling or flying objects, or from accidental tool blows. Write for literature or a trial pair.

ELLWOOD SAFETY APPLIANCE COMPANY
219 SIXTH STREET ELLWOOD CITY, PENNA.

Combination Foot-Shin Guard

Foot Guard Equipped With New Anti-Skid Full Sole

Fibre-Shin or Shin-Knee Guard

Penetred SAFETY **SOLES**

$2.00 POST PAID
INCLUDING CEMENT

16 ROWS OF WIRE *Claws*
IMBEDDED IN RUBBER

***PROVIDE* SURE FOOTING ON *ANY* SURFACE**

You'll have SURE FOOTING the minute you put on the soles and your shoes will be dry because PENETRED Safety Soles are made of High Class Rubber that you securely cement to your work shoes, boots, and rubbers . . . they grip even better as they wear. Sold on a Money Back Guarantee.

State size when ordering.
Send check or money order.

FREE SAMPLE UPON REQUEST

PENETRED CORP.
BLOCK C
Marshfield, Wis.

manent enough so that the marking cannot be changed inadvertently and without a certain amount of effort.

The respirator should be turned in to the central station at the end of each shift to be cleaned and repaired if necessary. It should be sterilized about once a week when retained by the same employee.

Where the maintenance crew works several shifts, one respirator per employee may be sufficient, but in general, it will be necessary to have one complete unit in the process of cleaning and repair while the other unit is being worn.

Training in Use

Respiratory equipment is often used under conditions of strain and excitement. Therefore, those who will have to use it should be trained carefully. Regular inspection is also essential to avoid deterioration of equipment not in service.

The following items of training and maintenance are important:

1. Train each person in proper method of putting mask on and rapidly adjusting it to the face.

2. Have each person wear it long enough to become accustomed to the breathing resistance and to putting it on and taking it off.

3. Repeat training at regular intervals.

4. Set up a card for each mask to indicate date of latest inspection and replacement of canister and amount of use, if any, which canister has had.

5. Replace canisters at least annually, whether or not they have been used.

6. When canister is replaced, examine face piece, harness, hose, and headbands for leaks or deterioration; replace defective parts.

7. Canisters are ordinarily supplied with seals to prevent entrance of air until they are put into service. Remove seals when canister is installed.

8. Store mask in a place readily accessible to hazardous area, but as cool and dry as possible.

9. If mask is used for emergencies only, it is wise to replace the canister after each use.

Hearing Aids

There are many jobs in which a deaf person can work with normal efficiency and safety. In other occupations, however, deafness may be a handicap and a hazard to the individual and his fellow workers. The salvaging of skills of persons with defective hearing is an important phase of vocational rehabilitation.

In most cases, deafness is not merely loss of amplification. Some persons may have more difficulty in hearing high tones and others in hearing low ones.

Many persons with varying degrees of deafness have been helped by hearing aids. For best results, these devices require careful fitting and usually service at intervals after fitting. The American Medical Association maintains a list of hearing devices which meet essential requirements.

With properly fitted hearing instruments, men are holding almost every kind of job in industry — in the factory as well as in the office.

Audiometric examinations are useful in measuring progressive loss of hearing. When hearing has suffered from exposure to excessive noise, an employee may be transferred to quieter surroundings.

Persons with some types of impaired hearing actually hear better in noisy places. Placing such persons on noisy operations will avoid risk to those with normal hearing.

Where sound levels are inevitably high, use of ear protectors will often afford considerable relief.

Work Furniture

WORK FURNITURE, well designed, prevents much unnecessary fatigue. Work surfaces of the correct height and posture chairs adjusted to the needs of the indi-

Buhrke SAFETY PRODUCTS
FOR CONSTRUCTION AND MAINTENANCE

RUBBER GLOVE CARRIERS
Made of hard woven duck. Snaps on safety belt.

TOOL BAGS
Big selection canvas with leather reinforcement, all canvas or all leather.

EDGED TOOL GUARDS
For pruning saws, chisels, handsaws, axes, bush hooks, tree trimmers, or any edged tool. Special designs on request.

SAFETY STRAPS
Made from backs of hides of young American steers. Drop forged hardware. Several types. Also available in corded fabric and linen.

TOOL BUCKETS
Collapsible, non-metallic. A type for every need!

TOOL POCKETS
Several designs for carrying screwdrivers, pliers, rules, knives.

SPECIALISTS FOR OVER FIFTY YEARS
R. H. BUHRKE CO.
4701 WEST GRAND AVENUE
CHICAGO 39, ILLINOIS

LINEN SAFETY BELTS
Light, flexible, comfortable! Several styles with or without shoulder straps.

The Finest in Safety Belts and Harness

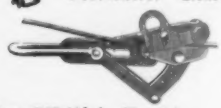
LINEMEN'S SAFETY BELTS
A complete line made of finest quality leather. A design for every need.

Write for Catalog!

$249 Tool Belt with Sliding Trace

233 "Klein-Kord" Safety Strap

1945 ADJ Adjustable "Polemaster" Climbers



1628-BH Klein Hot Line "Chicago" Grip

202

01 NE

301

Klein Pliers

The remarkable record of safety made by utility companies over the years is due in no small measure to the equipment used by the men on the job.

For nearly a century the name Klein has stood for the finest in pliers and climbers, safety straps and belts, grips and wrenches.

Men whose lives depend on the equipment they use realize there can be no substitute for quality. The name Klein is generally accepted as standing for the finest in linemen's and electricians' tools and equipment.

Foreign Distributor:
International Standard Electric Corp.
New York

The Klein Pocket Tool Guide, showing the Klein line and containing useful information, will be mailed on request.

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
3200 BELMONT AVENUE CHICAGO 18 ILLINOIS

vidual make an important contribution to health and efficiency.

Ideal conditions would have alternating periods of sitting and standing while at work. Since this is not always possible, furniture should be planned for maximum comfort.

Work benches. The height of work surfaces, such as benches, machines, desk, tables and assembly lines, is determined by whether the worker is seated or standing at the job. It is also influenced by such factors as whether the hands or the eyes are more important to the operation.

Tilted or recessed tables are useful for some operations.

Floor mats. Standing in one spot for long periods is fatiguing, particularly when the floor is hard and cold. Where covering the whole floor surface with resilient material is not practicable, small mats are helpful.

Posture chairs. Factory chairs are used in combination with benches, machines and tables. The proper height relationship between the seat and the work is important. Workers differ greatly in size and proportions and seat height should be adjusted to individual needs rather than to the working surface.

The posture chair also provides back support. Without it, the worker uses part of his energy just sitting up. The back rest fits into and supports the back between the lower ribs and the hips.

The seat should not touch the tendons and blood vessels on the back of the leg just above the knees. A very soft seat is not desirable and the contour is more important than upholstery.

Unless a posture chair is adjusted to the individual worker, most of its benefits are lost.

JANITORS
Cleanup Men

1. Immediately report unsafe conditions that you cannot take care of yourself.
2. Report all injuries. Get first-aid promptly.
3. Be on guard against broken glass, pins, razor blades and other sharp objects in waste material.
4. Before cleaning woodwork or walls, go over them for protruding nails, tacks and splinters.
5. Wear gloves while using steel wool.
6. Never leave buckets, brooms, mops or other articles standing on the stairways or in aisles.
7. When scrubbing or mopping passageways, leave enough dry surface for safe walking.
8. Watch for fire hazards; remove and report them.

SAFETY INSTRUCTON CARD No. 134
National Safety Council

W. H. SALISBURY & CO.

★ EST. 1855 ★

401 N. MORGAN STREET — **CHICAGO, ILLINOIS**

MANUFACTURERS OF RUBBER PROTECTIVE EQUIPMENT
FOR LINEMEN AND OTHER HIGH VOLTAGE WORKERS

INTERLOCKING LINE HOSE

Completely surrounds the wire with a thick wall of rubber having high dielectric strength. Locks itself in place but is easy to apply or remove.

Sizes: 5/8", 1", 1¼", 1½" inside diameter.

Lengths: 3', 4½', 6'.

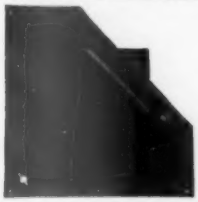
RUBBER INSULATOR HOODS

Used in conjunction with Line Hose to cover conductors as they pass over insulators. Inward extending flanges prevent accidental dislodgement. Compact construction. Convenient to handle.

CONNECTOR-END LINE HOSE

Standard Line Hose with built-on connector-end for joining to additional lengths or for covering enlarged wire taps, leads on stud type transformers, etc. Sizes same as standard line hose.

LINEMEN'S RUBBER BLANKETS



Indispensable for covering odd shaped equipment. Made of best grade rubber with long-life and high dielectric qualities. Sizes 36" x 36" and 36" x 27". Also available with "Snap-On" buttons and eyelets.

SNAP-ON RUBBER JACKETS

Highest quality small size rubber blanket, 22"x22", equipped with Salisbury hard rubber button fasteners and used to cover dead ends or other similar hazards that require securely fastened protection.

LINEMEN'S TOOL BAGS

Non-metallic canvas bags properly shaped and constructed for safety in raising heavy tools and supplies to men on poles or other elevated places. Sizes 8"x 14" or 12"x16" for tools and 7"x43" for line hose.

LINEMEN'S RUBBER SLEEVES

Protect the arms and shoulders from accidental contact with "hot" equipment. Held in place by adjustable rubber strap across the shoulders. Made in chromium plated molds to insure high voltage resistance, smooth surface and long life. Regular and extra large sizes.

ELBOW-LENGTH RUBBER SLEEVES

For protection of the forearms, short sleeves are often preferred to extra-long gloves. They fit better and are more economical to replace in case of damage. Furnished in regular size or extra large size for use over winter clothing.

LINEMEN'S GLOVE BAGS

Necessary for glove protection in storage and transportation and useful, when properly labeled, for personal identification. Made of heavy waterproof duck, sturdy and durable. Snap hook and "D" ring attached. Size 8" wide, 15" long.

LINEMEN'S RUBBER GLOVES

Best grade steam-cured gloves, carefully made to meet all standard specifications. Furnished in curved or straight finger style. Standard gloves are rated at 10,000 volts.

15,000 or 20,000 volt gloves are available. All sizes and half sizes from 9 to 12.

RUBBERCUFF PROTECTOR GLOVES

Similar to our standard all-leather protector glove with the addition of a full-length molded rubber cuff. Rubber cuffs do not increase current creepage to the forearm. They prevent costly snags in gauntlets of linemen's rubber gloves which are required to extend beyond ordinary leather protectors. Furnished in several sizes to fit perfectly over rubber gloves.

ALL-LEATHER PROTECTOR GLOVES

Worn over rubber gloves to protect them from injury. Made of specially tanned Grade "A" buffed horsehide and carefully designed to fit perfectly over rubber gloves. Soft and pliable under all conditions. Do not become slippery when wet. Band-top or gauntlet styles. All sizes.

A SPECIAL DEVICE FOR EVERY HAZARD

SWITCHBOARD MATTING

Made especially to provide insulation from possible ground in front of switchboards or other electrical equipment. Rated at 40,000 volts and meets the A. S. T. M. specifications. Widths 24", 30", 36", 48". any length.

MISCELLANEOUS EQUIPMENT

Static Resisting Rain Coats

Electric All-Rubber Rain Coats

Industrial Rubber Rain Coats

Linemen's Rubber Boots

Linemen's Rubber Hats

Non-Spillable P. B. Paint Pots

All-Rubber Cable Bandages

Blanket Canisters

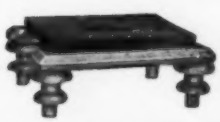
Blanket Clamp Pins

Linemen's Sleeve Containers

Cable End Test Caps and Separators

★ SEND FOR CATALOG L-4 ★

ELECTRICIAN'S INSULATING STOOLS



Designed to provide a safe, low platform for men with hazardous tasks in substations, underground vaults and power plants. Size 18" x 12" x 8" high. Guaranteed withstand 10,000 volts.

Bar Youths on Hazardous Machines

Youngsters under 18 will not be permitted to operate certain power-driven metal-working machines cited as hazardous in a new order proposed by Secretary of Labor, Maurice J. Tobin, pursuant to the child labor provisions of the Fair Labor Standards Act.

Machines declared hazardous in the proposed regulation known as Hazardous Occupations Order No. 8, include rolls for bending or reducing the thickness of metal, all punching and pressing machines such as punch presses, brakes for bending sheet metals, power and drop hammers, and all shears used for cutting metals. In announcing the proposed order, Secretary Tobin cited the high percentage of serious injuries and permanent disabilities occurring in the operation of these machines—much higher than the average for all manufacturing injuries.

Secretary Tobin simultaneously proposed an amendment to Order No. 7 prohibiting the employment of minors under 18 on manlifts—endless belts equipped with platforms operating vertically through holes in the floors of a building. Outlawed in some locations as hazardous for all workers, these manlifts are primarily used in public parking garages, grain elevators, flour mills, and the like.

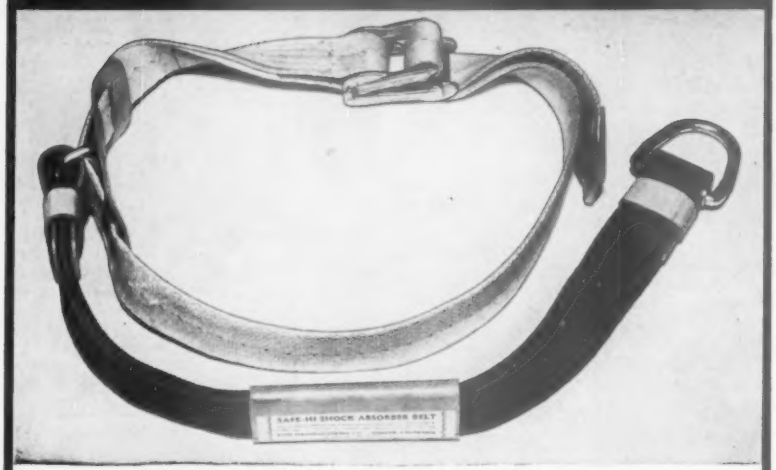
Formal texts of the proposed order and the amendment have been published in the Federal Register. Copies may be obtained from the Bureau of Labor Standards, U. S. Department of Labor.

Labels for Solvents

Commissioner John J. DelMonte of the Massachusetts Department of Labor & Industries announced the promulgation of rules and regulations relative to the labelling of receptacles containing benzol and carbon tretrachloride effective January 1, 1950. Copies of the rules and regulations may be obtained from the Division of Industrial Safety, Massachusetts Department of Labor & Industries, 473 State House, Boston.

These rules and regulations require the labelling of receptacles in which benzol or carbon tetrachloride, or mixtures containing these substances in amounts greater than 1 per cent, must be labelled if they are used, sold, or stored in Massachusetts. The required marking differs in some respects from that agreed upon by the Manufacturing Chemists' Association and the Surgeon General of the U. S. Public Health Service.

Safe-Hi
SHOCK ABSORBER BELTS



THE BELT THAT "PUTS ON THE BRAKE" when stopping a falling man!

Note the Unolyn shock-absorber, between belt and life line. The difference between a fall cushioned with this device and the violent jerk when a man hits the end of his lifeline in conventional safety belts—is the difference between stopping your auto with brakes or stopping it against a stone wall!

Unolyn (of the nylon family) has the amazing ability to elongate, without rebound, to several times its original length under such a load as a falling man. This s-p-r-e-a-d-s the impact—even when steel life lines are used. Men's lives are saved!

Shock absorbers also available with attachments to fit your present belt.

See your safety dealers or write

Safe-Hi PRODUCTS

ROSE MANUFACTURING COMPANY
1731 Arapahoe, Denver 2, Colo.

Safety Pouches

WORN ATTACHED TO LINEMEN'S BODY BELT.

Keeps screws, bolts and other parts in easy reach and speeds up the job. Sturdy canvas construction. Reinforced top edge to provide easy access. Attaches to the belt by means of web strap loops or snap hook. Top measures 8¼" x 2½"; overall depth 8⅓". Other styles available.

Write for Bulletin K-30A

IPCO
Safety Equipment for all Industries
INDUSTRIAL PRODUCTS COMPANY
2850 N. FOURTH STREET · PHILADELPHIA 33, PA.

HANDLING MATERIALS

Industrial Trucks and Tractors 123
Hoisting Apparatus 124
Wire Rope 125
Chain for Industrial Use 126
The Safety Library 134
Fiber Rope 136
References 136

MATERIALS handling in industrial processes brings problems to both operating and safety departments. Every unnecessary handling operation adds to production costs, also opportunities for accident.

Substitution of mechanical for manual methods has invariably been followed by operating economies as well as by reduction of accidents.

All material handling systems should be integrated and correlated with production.

"Unit loading" is a principle of many efficient systems. The more material that can be combined in one unit and moved intact, the lower the cost and the shorter the time. Unit loads are assembled into power-handling units on trailers, skids and pallets.

Types of equipment range from wheelbarrows and hand trucks to cranes that will lift many tons. Some of the mechanized items are:

1. Hand lift trucks
2. Platform trucks
3. Tractors and Trailers
4. Lowlift and Highlift Trucks
5. Hoists—Hand and Power
6. Cranes—Portable, Wall, Overhead Traveling, Gantry and Locomotive
7. Elevators

Each of these general classifications is divided into specific types for specialized uses.

Conveyors, traveling cranes, and elevators operate in fixed paths. They are needed where large quantities of materials move in a continuous flow but they have definite limitations.

The average plant's material handling system also needs more flexible types of equipment that may be moved throughout the plant or yard. Many of these devices are developed to facilitate handling objects of unusual size or shape.

Load-Bearing Parts

Wire rope, chain, fiber ropes, and slings made of these materials are called upon to lift heavy loads—often overloads. Equally heavy demands are made on accessories, such as hooks, and rings. All parts must be selected for the needs of the job and kept in serviceable condition by regular inspection and maintenance.

Industrial Trucks and Tractors

Trucks of many types, both hand and power-operated, are keeping goods moving in factories, warehouses, docks and railroad terminals. There is a wide variety of types suitable for most industrial needs.

Wheelbarrows are particularly useful for hauling and dumping bulk materials. They can be used in places where a truck would be difficult to maneuver. Rubber tires and the use of aluminum and magnesium alloys for the body have made them much lighter and easier to handle.

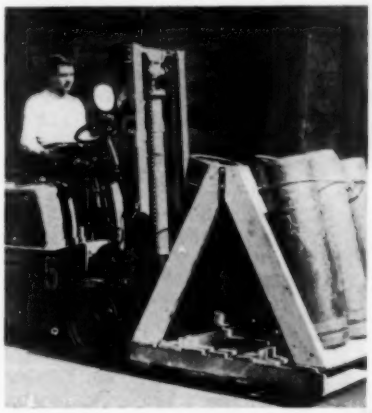
Hand trucks, both 2-wheel and 4-wheel, are essentially simple devices but there are hazards in use. A few safety refinements have been added, such as knuckle guards and brakes on 2-wheel trucks, and a counterweight tongue on a 4-wheel truck to keep it off the floor when not in use.

Hand lift trucks are practical and economical where loads are not too heavy and distances relatively short.

MECHANICAL VS. MANUAL HANDLING

UNSAFE PRACTICE WHILE HANDLING MATERIAL	MECHANICAL EQUIPMENT	MANUAL HANDLING
Insecure gripping of material	2	51
Improper use of equipment	6	0
Lifting too heavy loads	4	73
Placing material in insecure position	11	34
Lifting while in awkward position	0	35
Standing or walking under suspended load	9	3
Other unsafe practices	24	95

(These figures are from an analysis of materials-handling accidents by a large corporation with diversified operations)



Fork trucks save much handling when material is carried on pallets or skids. This special pallet was made to carry cylinders. (Saco-Lowell Shops).

Tractors and trailers are used where large quantities of materials must be moved over relatively long distances, as at freight terminals and piers. Loading and unloading must be done manually or by crane or other external means.

Platform trucks also require external means of loading and unloading. They are used on steamship piers, hauling mail, express and baggage at railroad stations, and in industrial plants where cranes are available.

Lift-truck-skid system. This was the first self-contained handling system combining picking up, transporting and setting down without manual or other external handling.

The success of skid handling with the low-lift truck suggested the possibility of extending it so as to tier loaded skids one above the other.

Fork-truck pallet system. Similar to the lift-truck-skid method, forks require less clearance than the elevating platform of the lift truck so pallets may be made shallower than

skid platforms. Double-faced pallets afford wider load distribution, which is an advantage in tiering. Pallets can usually be built more cheaply than skids.

Goods shipped in boxes or crates need no pallets; it is only necessary to attach batten strips.

Baled pulp, rolls of paper or burlap, and boxes or drums can also be picked up and tiered by the fork truck without the use of pallets.

Special types of trucks apply the principles of the unit load and self-loading to the handling of materials not adapted to skids or pallets.

Crossover Bridges

Where loading docks are separated by railroad tracks, crossover bridges are needed. Some are of the familiar drawbridge type; others are mounted on four pillars that can be raised or lowered quickly by push-button control.

Hoisting Apparatus

Mechanical equipment is used for handling heavier loads, for reasons of operating efficiency. Conveyor systems are needed when enough material flows steadily in one direction.

It is the loads which are just a little too heavy or too frequent that cause many strains and much fatigue.

There are many jobs which do not require a fixed installation or heavy-duty equipment. Here lighter and more flexible devices are often used.

Types of Equipment

Included in this classification are the following types of equipment:

1. Block and tackle.
2. Chain hoists.
3. Electric and air hoists.
4. Jib, pillar and wall cranes.
5. Portable floor cranes.
6. Tiering hoists.

Block and tackle. Blocks threaded with fiber or wire rope are used for suspending scaffolds, raising objects, and for many other industrial purposes. When used to lift heavy materials or to hold loads in suspension, as on heavy duty scaffolds, wire rope should be used.

Chain hoists may be used in locations where overhead cranes cannot be installed on account of lack of head room. They also fill a demand for handling heavy pieces at machines where there is frequent need for a hoist. One chain hoist may handle the work at one or more machines.

Steel is recommended for load-sustaining parts. It will withstand sudden shock better than cast iron and is much lighter in weight for parts of equal strength. Chain should be of best quality steel and should be welded.

Each hoist should be equipped with a braking device which will automatically lock the load when hoisting is stopped.

Chains and sheaves should be lubricated at intervals, depending upon atmospheric conditions. Life of equipment is increased by keeping it properly oiled.

Electric Hoists, in various sizes and capacities, operate faster than hand-operated hoists and help to reduce fatigue.

Limit stops prevent the hoist from traveling too far in case the operating handle is not released in time.

Air hoists. These consist of air cylinders mounted on hangers or trolley carriages and operated by air pressure. Many of the operating problems are similar to those of chain and electric hoists.

Jib cranes can lift, lower and rotate a load within the scope of the circle covered by a rotating arm or jib upon which runs a trolley. The jib is usually supported from a wall or column. A hoist—hand-operated air or electric—is suspended from the trolley. A substantial stop at the end of the jib arm prevents the trolley running off.

Portable floor cranes or hoists are mounted on wheels that can be moved from place to place, either by hand power or under their own power. These raise and lower loads in a vertical line. They will not rotate around a fixed point.

Jib crane with electric hoist used to place finished gear in crate preparatory to sealing and shipping. (Westinghouse).

Such hoists are useful in plants where overhead belting, shafting, etc., prevent the use of overhead cranes, and where service is not frequent enough to justify more expensive equipment. The lifting mechanism usually consists either of a winch with wire rope and block, or a chain hoist, operated by hand or by electric power.

If hoists are operated by electric power they should be effectively grounded to prevent shock in case of short circuit.

Tiering hoists. This type of portable floor hoist is designed to raise material in a vertical line on a platform. These are sometimes called stacking elevators, portable elevators, tiering machines, or platform hoists.

This equipment operates either manually or by motor power. They are used extensively in warehouses for piling and storing materials. They should be equipped with a braking device to permit the safe lowering of a platform and a ratchet lock or dog should be provided to lock the platform in position during loading and unloading.

Safeguards on tiering machines include limit stops for top and bottom travel limits on the hoisting cable drum, as well as for the shipper rope, if one is provided. When in use, casters should be lifted off the floor.

Crabs and winches are used on construction work and occasionally in plants for moving cars, unloading heavy material and hoisting material to upper floors. A dog should be provided to lock the gears, also some form of brake or safety lowering device.

Conveyors

Wherever material moves in continuous flow, power-operated and gravity conveyors eliminate much handling and many opportunities for injury. The principal types are roller, chute, belt, chain, portable, screw, pneumatic, monorail and overhead trolley.

Gravity conveyors are of two general types—chute and roller.

Fixed conveyor systems are installed where there is a heavy volume of material moving in one direction. For efficient and economical operation such systems require thorough study of the plant's manufacturing and material handling problems.

Power driven conveyors should be equipped with emergency stopping devices located at convenient points.

Crossover bridges with adequate handrails should be placed where needed. Side boards along edges and at turns of overhead conveyors and screen guards underneath high runs protect workers from falling material.

—To page 128

Wire Rope

WIRE rope provides the high tensile strength and moderate flexibility needed for heavy lifting and haulage and for supporting rigging. It is serviceable under varying weather conditions but it should not be exposed to excessive heat or corrosive substances. Nor should it be dragged over abrasive surfaces.

In selecting and using wire rope, the following should be considered:

1. Size
2. Construction
3. Grade
4. Equipment on which rope is to operate
5. Handling, installation and maintenance of the rope.

Constructions. Wire rope is manufactured in a variety of constructions, each designed for certain service conditions.

In designating construction, the first numeral identifies the number of strands in the rope, the second, the number of wires in each strand. This is followed by a term describing the geometric arrangement of wires in each strand, e.g. 6 x 19 Filler Wire.

The 6 x 19 construction is the most generally useful. As the number of wires per strand increases, flexibility and reserve strength increase but ability to withstand abrasion decreases. A 6 x 7 construction has higher resistance to abrasion but less flexibility.

The core serves as a foundation for the strands. Three types of cores are used—fiber, independent wire rope, and wire strand. Fiber gives elasticity to the rope and is adequate for normal operating conditions.

Metal cores are used where maximum strength and minimum stretch are important, or where heavy loads or overwinding on a drum causes excessive pressure of strands against the core, or temperature is sufficient to dry out a fiber core.

Type of Lay. There are two general methods of laying up rope: (1) Regular lay in which the strands are laid in the opposite direction to that of the strands in the rope, so that on the outside of the rope the wires lay approximately parallel to the rope axis; (2) Lang lay rope, in which the wires and strands are laid in the same direction.

Regular lay ropes are standard for most applications. They are easier to handle during installation and less susceptible to kinking.

Lang lay rope has good flexibility and high resistance to abrasion and fatigue.

Wire ropes are made either right or left lay. In most cases it makes little or no difference which type is used; right lay is standard.

Rope Grades

The material of which a rope is made is a most important factor. Rope wires are usually made of the following materials and designated by their names. (Minimum tensile strengths are quoted from Federal Specifications RR-R-571 a.)

Improved plow steel. Has highest strength and toughness and most wear resistant properties. Most frequently selected for heavy duty service, as in deep shafts and on excavating machinery. Minimum tensile strengths, 218,000-244,000 p.s.i.

Plow Steel. Strength about 15 per cent less than improved plow steel. Serviceable for haulage, hoisting, logging and miscellaneous service. Minimum tensile strengths, 190,000-212,000 p.s.i.

Mild Plow Steel. Combines toughness with pliability, making it capable of undergoing repeated impact stresses. Used principally for cable tool drilling. Minimum tensile strengths, 165,000-184,000 p.s.i.

Cast Steel. Where strength is not the controlling factor, its pliability is important in long fatigue life. Resistant to acid mine water. (Not listed in Federal Specifications.)

Traction Steel. Used in hoisting ropes for traction type elevators. High resistance to bending fatigue and minimum abrasive action on sheaves and drums. Minimum tensile strength, about 160,000 p.s.i.

Iron. Low tensile strength (about 70,000 p.s.i.) but very ductile. Used principally in elevator service where it is being replaced by the more serviceable traction steel.

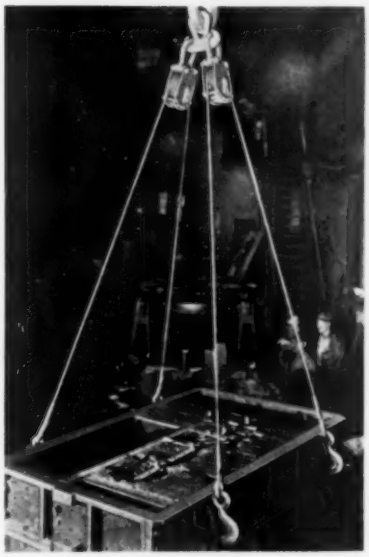
Corrosion resisting metals. Where corrosion is a factor, such metals as stainless steel, bronze and monel metal are frequently used. All metal ropes are preferred to fiber core ropes.

Stainless steel is used in marine operations, on aircraft, and where rope is exposed to alkali, acids of an oxidizing nature (such as nitric), neutral brines, food products, and temperatures damaging to carbon steel ropes.

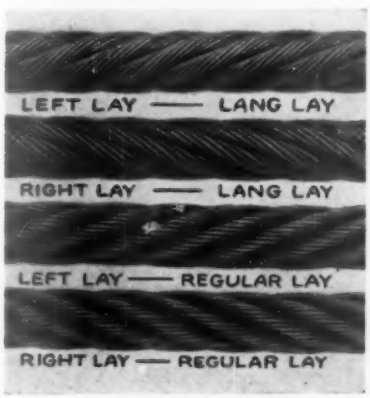
Bronze has strength slightly in excess of iron rope. It is used frequently in marine service.

Monel metal is used where rope is exposed to marine atmospheres, acids of a reducing nature (such as sulfuric, muriatic and hydrofluoric), neutral brines, food products, pickling solutions, and aromatic chemicals.

Corrosion-resisting ropes are furnished in complete assemblies and slings with fiittings attached. Temperature, humidity, nature and concentration of corroding chemicals should be considered in selecting equipment.



Wire rope slings and accessories are designed for many types of industrial use. (MacWhyte Company).



Standard wire rope constructions made by all wire rope manufacturers.

Preformed Wire Rope

A preformed wire rope is one in which each individual strand, and at the same time each individual wire, is permanently formed into the helical shape it will assume in the finished rope. Some advantages of preformed rope are:

1. Higher resistance to bending fatigue.
2. Greater flexibility.
3. Less susceptible to kinking and therefore easier to install.
4. More equal distribution of load on each strand and wire.
5. More resistant to whipping and vibration.
6. Hugs small drums better and winds more uniformly and smoothly.

—*To page 128*

Chain for Industrial Use

One of the heavier loads that sling chains are called upon to lift. This one weighs 183,800 pounds. (American Chain and Cable Company).

STRENGTH and flexibility, resistance to abrasion, heat, shock, wear and corrosion are qualities which make chain in heavy demand for the hoisting and haulage needs of industry. It should be remembered, however, that not all types of chain measure up to the requirements of specific jobs.

Actual conditions under which chain will operate should be considered in selecting types. Impact loading factors should be considered and allowance made for bumpy craneways, rapid lifts and sudden stops. Heat, corrosive atmosphere, and unnatural strains also affect the selection.

Specifications for various types of chain have been compiled by the American Society for Testing Materials. The safe load may be determined from tables issued by the manufacturer.

Safe working load means the maximum load which should be applied to a chain in direct tension. **Breaking loads** are merely of theoretical interest to the used. They are misleading and apt to promote unsafe practices.

Proof test means the actual test in pounds applied to the chain and attachments before leaving the factory. Proof test figures should not be considered as safe working loads. These tests are followed by visual link-by-link inspection by experienced inspectors.

Types of Chain

Following are types of chain commonly used in industrial operations:

Wrought iron chain (crane or dredge) has high resistance to shock fatigue and corrosion. This chain has close links and is used for slings, hoists, cranes, power shovels, and marine purposes where human life and property depend on its endurance.

Welded steel chain (low carbon) is made in three common types: Proof Coil, BBB, and Steel Loading.

Proof Coil is used principally for towing, binding, logging and similar operations. Links are comparatively long. Proof Coil chain is not suitable for lifting or for slings.

BBB Coil is a higher grade than proof coil, with safe working load approximately 25 per cent greater. Shorter links give greater flexibility. BBB coil chain is not suitable for lifting or for slings.

Steel loading chain has a tensile strength approximately 50 per cent higher than BBB. It is used in the logging industry for binding and loading logs and in oil fields for handling pipe and heavy equipment.

High test chain (high carbon) is heat-treated to give it high tensile strength and resistance to impact loads. Tensile strength is approximately double that of ordinary steel chain. Ductility is moderate. Where resistance to wear is most important, it permits use of a smaller and lighter chain.

Alloy steel chain (general purpose) has exceptional strength for weight and size. It is resistant to some types of corrosion. It is frequently used where maximum tensile strength and resistance to abrasion is required, with reasonable resistance to impact.

Definite and known conditions of use are important and the manufacturer should be consulted about applications.

Special purpose alloy chain is considerably higher in cost and is used under working conditions where other materials would deteriorate quickly.

Stainless steel is high in tensile strength, fair in elongation, but low in impact resistance. It is used chiefly for ornamental installations and nitric acid pickling.

Monel has fair tensile and impact strength and elongation. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Bronze has good elongation and fair resistance to impact, but low tensile strength. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Specialized types of chains have been developed for certain industries, such as those used in marine operations.

Finishes are sometimes added to chains to provide added protection from corrosion or for decorative value.

Storage. When not in use, each chain should be hung or placed in a neat pile on the floor where it will not create a tripping hazard. Exposure to corrosive fumes or liquids should be avoided.

Safe Loads. Some plants stamp on a metal tag attached to each chain the safe vertical load which may be lifted with that chain. A better way is to stamp the safe load, or a reference number, on the ring or hook. Stamp marks should not be placed on links where they might form points of weakness.

The useful life of all material handling equipment, particularly rope and chain, is shortened by overloading, jerking, and neglect of the maintenance details recommended by the manufacturer.

Sling Chains

Sling chains are furnished complete with all attachments made to proper dimensions and of material specified for various uses with ample factor of safety.

Rings and hooks are as important as the chain itself and should receive the same attention in inspection and maintenance. A hook bent by overloading should not be repaired and put back into service. The stress of bending weakens metal so that its future strength is unreliable.

MONARCH
SINGLE PART

ATLAS
ROUND BRAIDED

DREW
FLAT BRAIDED

WIRE ROPE MACWHYTE SLINGS

Above are a few of the many sizes and types made to order in any length needed.

There's a Macwhyte Sling that's the right sling

for safe handling with maximum efficiency and economy

For cranes and hoists use PREformed MONARCH WHYTE STRAND CRANE ROPE made by MACWHYTE Company

Handling materials is easy when you have Macwhyte Slings made special to your needs. Call your Macwhyte Distributor or write direct to Macwhyte Company.

Member National Safety Council

MACWHYTE COMPANY
2902 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cable and Assemblies, Stainless Steel and Monel Metal Wire Ropes. Catalog on request. Macwhyte distributors throughout the U.S.A. and other countries. Mill depots in the following cities: New York, Pittsburgh, Chicago, Minneapolis, Fort Worth, Portland, Seattle, San Francisco, Los Angeles.

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MASTER SPEEDLIFT Trucks
POWERMASTER Stackers
FLOORMASTER Trucks
SHIPMASTER (All-Steel 2-Wheel) Trucks
WELDMASTER Platforms
LOADMASTER Racks

Smart fleet of "SPACEMASTER" Electric Fork Trucks handle many kinds of materials in this public utility warehouse.

"SPACEMASTER" Electrics operate quicker, in less space. "SPACEMASTER" Electrics have low cost maintenance, less down time. "Standrive" feature lets operator pivot and turn and thus safely trail load. No need to turn truck and load around as his vision is unobstructed. Better visibility also permits accurate placement of forks and spotting of loads . . . "Deadman" brake; greater stability; plus free, quick access from either side give greater SAFETY . . . Send For Bulletin 25 Today!

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WRITE FOR BULLETIN NO. 25

LEWIS-SHEPARD
PRODUCTS INC.
163 WALNUT STREET, WATERTOWN 72, MASS.
Midwest Plant: Crawfordsville, Ind.
REPRESENTATIVES IN PRINCIPAL CITIES

Conveyors

(From page 124)

Portable conveyors, mounted on casters or wheels, can be moved where needed for short material-handling jobs. These are made in roller, belt and bucket types for handling packages and loose material. They are often used at warehouses, docks, shipping platforms, coal yards, and sand and gravel pits.

Acid Handling

Acids, alkalies and other corrosives require a variety of specialized handling apparatus. Devices include buckets, dippers, funnels, pitchers, pumps and carboy inclinators.

Bags for carrying bottles of corrosive liquids lessen the risk of accidental breakage. The bag is of impermeable, acid resistant material and padded.

Materials used for equipment include rubber, (natural and synthetic), stainless steel, and certain types of plastic. These materials are of many types which differ quite widely in their resistance to corrosives.

Wire Rope

(From page 125)

7. Operates over sheaves with less rotation around its axis, resulting in less wear on rope and sheaves.

8. May be socketed with less danger of unbalancing the lay of the rope below the base of the socket.

9. Does not unravel when seizings are removed from ends of rope.

10. When outer wires break through fatigue, they do not protrude or "porcupine." This reduces risk of injury in handling.

Since broken wires are more difficult to detect in preformed rope, greater care is needed in inspection. However, broken ends separate slightly, permitting detection.

Strength and other qualities are the same for preformed and non-preformed rope of the same size, grade and construction.

Wire Rope Slings

Wire rope slings are widely used for heavy lifting. Wire rope should not be used, however, where there are sharp bends over an unyielding surface. Tension of outside strands may cause serious injury to the rope. Where a load has sharp corners, pads should be placed between the load and the sling.

Acids and strong alkalis cause quick deterioration of wire rope.

Fittings are no less important than the rope itself. They must be designed for severe wear and the heavy stresses of sling work.

—To page 132

NOW... Wire Rope Slings

with flexibility comparable to fiber rope

ACCO REGISTERED WIRE ROPE SLINGS rate high with Safety Engineers. However, operating men are often reluctant to adopt new equipment when it means a departure from long-established ways of handling standard jobs.

Maybe you don't *have* to depart from established custom to enjoy the advantages of ACCO Wire Rope Slings.

The picture above illustrates a case in point. The hitch is a typical fiber rope hitch. But the sling is not fiber rope. It is a Double ACCO-LOC Cable Laid Grommet. It has all the safety, dependability and uniformity of an all-steel, machine laid sling with flexibility comparable to fiber rope. The patented splice develops the full strength of the sling body—plus giving an armored section to use at point of greatest wear.

Like all ACCO Registered Wire Rope Slings, these grommets are rated as to capacity—proof-tested to twice the rated capacity.

Here's a possible way to reduce material handling costs, a certain way to have new safety, reliability and ease of accurate sling inspection. Write today for complete and detailed information about Double ACCO-LOC Cable Laid Grommets.

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GREEN CROSS FOR SAFETY

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Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

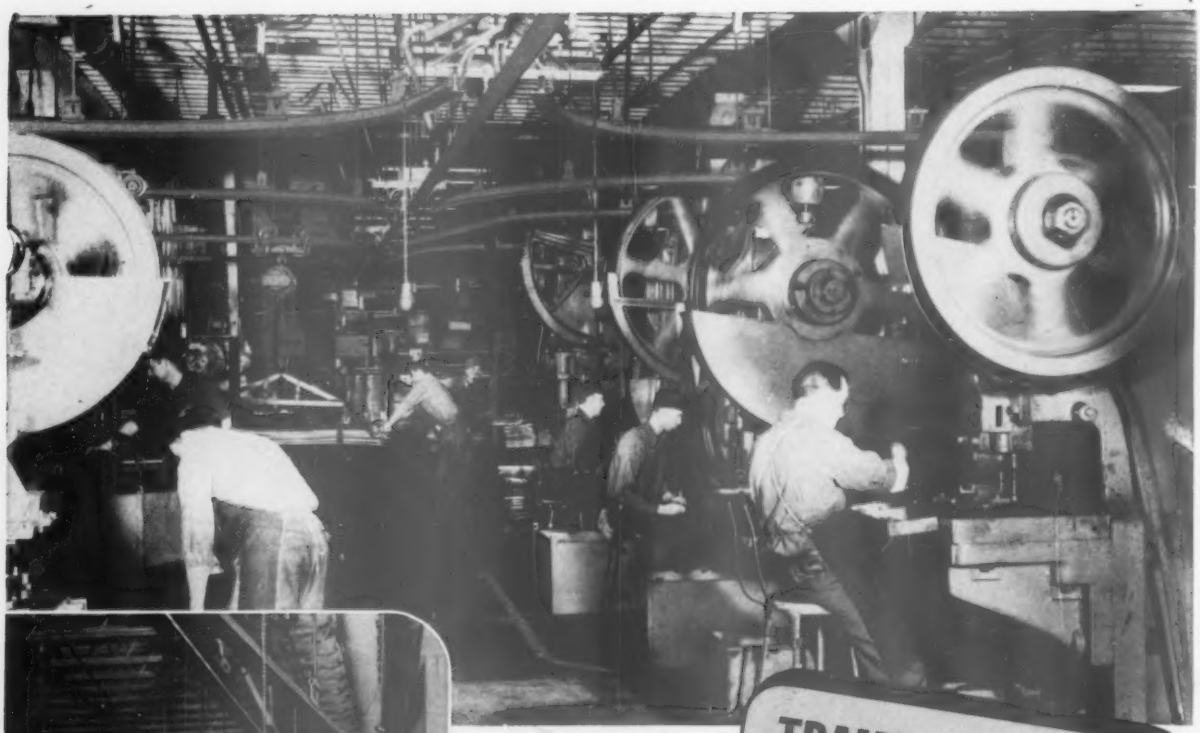
AMERICAN CHAIN & CABLE

WIRE ROPE SLING DEPARTMENT

TRADE MARK

In Business for Your Safety

ACCO Registered WIRE ROPE SLINGS



This illustrates the extreme flexibility of Cleveland Tramrail. This rail system is so laid out that hand-operated hoist carriers can deliver materials from any press to any other press without intermediate handling.

Courtesy United States Register Co., Battle Creek, Mich.

TRAMRAIL SERVES EVERY PRESS at United States Register Company

Boxes of materials are easily picked up and transported. If desired, this type of Cleveland Tramrail system can be electrified and the heavy lifting done with motor-driven hoists.

75% REDUCTION IN TIME FOR DIE CHANGES — NO HANDLING ACCIDENTS SINCE INSTALLED IN 1938 . . .

An inexpensive, easily-installed, hand-propelled Cleveland Tramrail system interconnects all presses with each other and also connects each with the die storage and machine shop. All but 18 small presses are served this way.

Hand and motor driven hoists are used in making die changes and servicing the presses with raw stock. Dies up to one ton are handled without difficulty and with 75% reduction in time over hoists formerly used.

No accidents in the handling of dies and materials have occurred since this system was installed in 1938.

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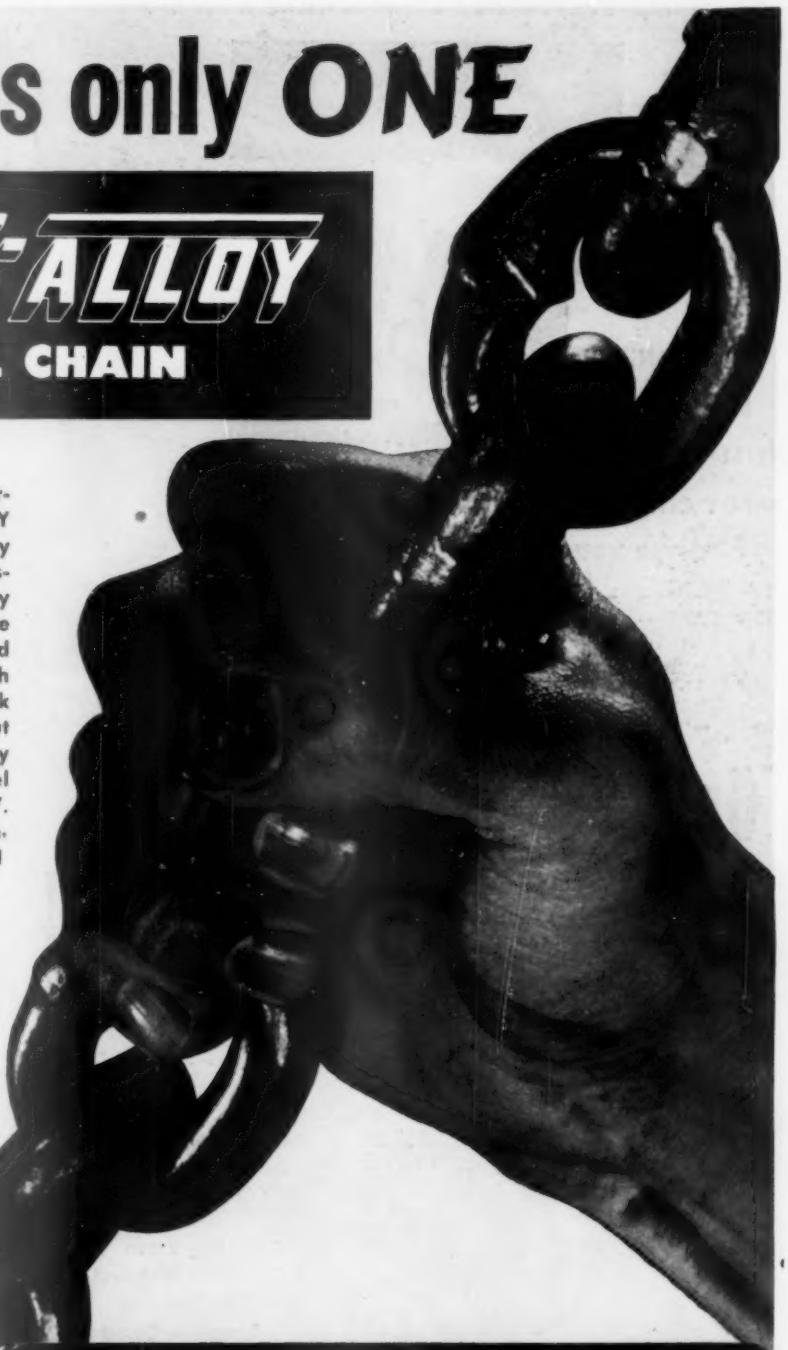
CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
6549 East 284th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

There is only ONE

HERC-ALLOY
STEEL CHAIN



The original and exclusive formula that made HERC-ALLOY America's first and safest alloy steel chain continues as industry's favorite. Emphasis may vary among users as to the relative importance of such service and safety features as ductility, high strength, weight, hardness, link design, long life and so on, but on one point most agree...they have yet to find an alloy steel chain superior to HERC-ALLOY. Preference founded on performance results cannot be denied

Safety **directors, management and production executives who have not yet had actual experience with HERC-ALLOY steel chain for slings or other materials handling jobs, should let a CM representative show evidence of what's happening in other plants.**

When writing ask for this popular booklet. Every safety director should have a copy.

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CHAIN CORPORATION

TONAWANDA, N. Y., U.S.A. • CABLE ADDRESS: KINCHAIN

MANUFACTURERS OF ALL KINDS OF INDUSTRIAL, AUTOMOTIVE, AGRICULTURAL AND MARINE CHAIN

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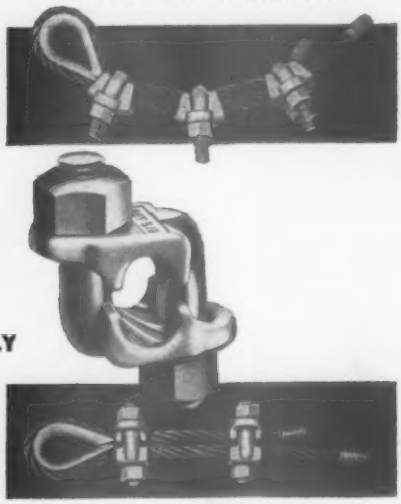
Manufacturers of all types of overhead materials handling equipment including hand and electric hoists, overhead trolleys and cranes.

AVOID THE "FINGER-PINCH"



ONLY LAUGHLIN "FIST-GRIP" SAFETY CLIPS

OFFER YOU ALL THESE SAVINGS:

- Fewer clips required . . . money saved
- No crimped, bowed rope . . . rope saved
- Fewer rope breaks . . . accidents saved
- Easy to put on . . . time saved
- Can't be put on wrong . . . accidents saved
- No battered threads . . . bolts saved
- No special wrenches . . . tools saved

Grip your rope with a FIST OF STEEL!

Buy From Your Distributor. The Thomas Laughlin Company, Portland 6, Maine

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

Wire Rope

(From page 128)

Causes of Failure. When wire rope fails to give the expected service, the reason is seldom a defect in the rope. Following are some of the more common causes:

1. Use of rope of incorrect size, construction or grade.
2. Allowing rope to drag over obstacles.
3. Lack of proper lubrication.
4. Sheaves and drums of inadequate size, causing short radius bends.
5. Overwinding or crosswinding on drums.
6. Sheaves and drums defective or out of alignment.
7. Ropes jumping sheave flanges.
8. Effects of heat, moisture, or acid fumes.
9. Improper fittings.
10. Permitting ropes to untwist.
11. Kinking.
12. Severe overloads, reverse bends, and other excessive stresses.
13. Internal wear caused by grit penetrating between strands and wires.

How to Order

When ordering wire rope, the following information should be furnished:

1. Length.
2. Diameter.
3. Construction — Number of strands; Number of wires per strand; Arrangement of wires in strand, such as Seale, Filler Wire, etc.
4. Type of Fabrication — If preformed rope is desired, it should be specified. Otherwise, non-preformed rope will be furnished.
5. Finish—Galvanized finish should be specified if required. Otherwise bright rope is usually furnished.
6. Grade—Improved plow steel, Plow Steel, Iron, etc.
7. Lay—Regular Lay Right Lay will be furnished unless otherwise specified. If Lang Lay or Left Lay is wanted it must be specified.
8. Core Specify fiber core, independent wire rope core, or wire strand core.
9. Lubrication—Type of lubricant should not be specified unless there are unusual service requirements. Each construction and grade of rope is treated with a lubricant best adapted to that particular rope for a wide range of service conditions.
10. Use for which rope is intended.

WIRE ROPE STRENGTH

Wire Rope Grades	Breaking Strength (Lbs.) of ⅝" Dia. Wire Rope
Iron	12,500
Traction Steel	23,000
Mild Plow Steel	24,600
Plow Steel	28,300
Improved Plow Steel	32,600

Wire Rope Lubrication

All wire ropes, whether used for inside or outside work, should be treated at regular intervals with a lubricant to keep them pliable and to prevent rust. Pound for pound, wire rope probably has more bearing surface (inside the rope) than any other equipment, so the importance of lubrication is obvious.

The best lubricants are furnished by manufacturers and dealers especially for lubricating wire rope. Oil, engine SAE 10 below 32° F., and oil, engine SAE 30 above 32° F., meet wire rope requirements.

Lubricants which meet specifications are free from acids and corrosive elements and have good penetrating and adhesive qualities. They do not cake, gum or ball-up if contaminated with dirt or metal particles.

Lubricant may be applied with a brush if no other method is available. The lubricant should be brushed on slowly, carefully and frequently because it is difficult to get complete coverage and penetration.

A more effective method is a simple three-sheave trough. It should be firmly fixed near the reel or drum and the rope run through the lubricant not faster than 30 feet a minute.

Idle wire ropes are most susceptible to damage by rust. It is therefore particularly important to see that they are well lubricated when not in service.

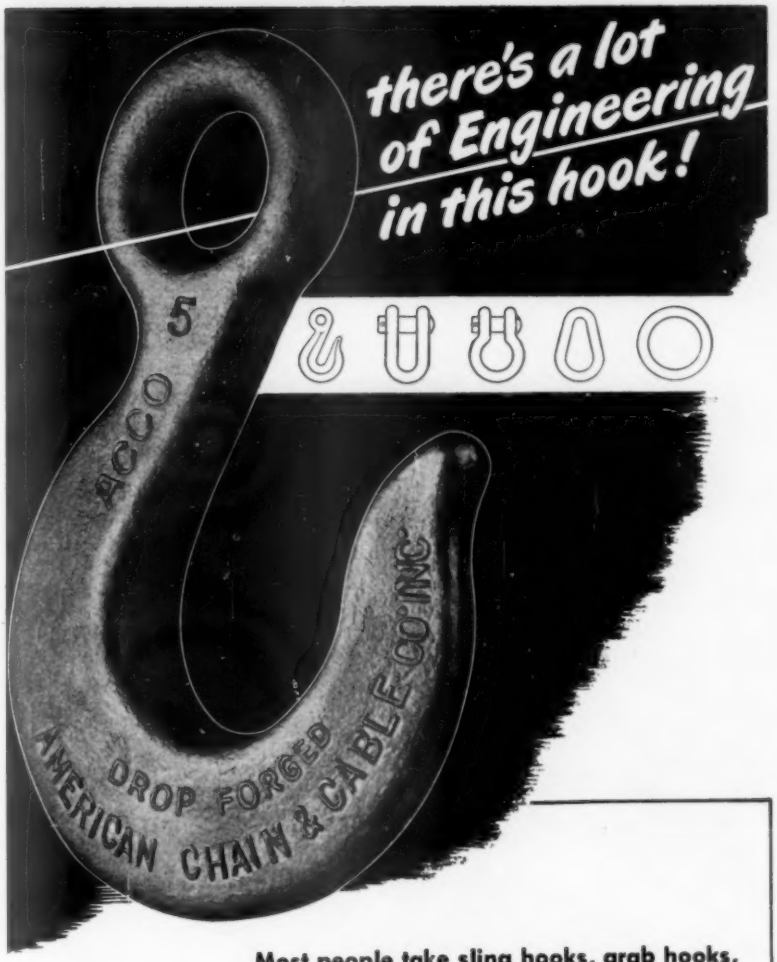
A regular lubrication and inspection schedule will insure full service from wire rope.

Illinois Conference on Industrial Safety

The First Annual Illinois State Governor's Conference on Industrial Safety will be held on May 1 and 2 at the Sherman Hotel in Chicago in conjunction with the 27th Annual Midwest Safety Show sponsored by the Greater Chicago Safety Council. Sessions of the Show will be held on May 3 and 4. The Fourth Annual Cook County Traffic Safety Conference and the Midwest Section—Regional Safety Meeting of the Association of American Railroads will also meet in conjunction with the Midwest Safety Show, according to an announcement made by Joseph F. Stech, manager of the Council.

Transparent Tarpaulins

Tarpaulins of Vinylite plastic sheeting have proved useful in many industries. The tarpaulins are waterproof and non-conductors of electricity and allow passage of enough light for easy visibility of work to be done. Telephone companies use these plastic sheets for the protection of linemen's repair work. They are also used for covering boats and trucks and for many specialized uses.



Most people take sling hooks, grab hooks, shackles—chain fittings of one kind or another—pretty much for granted . . .

Here at American Chain we take them seriously. Their design and manufacture call for a high type of engineering, plus years of experience.

The designers, metallurgists and other engineers responsible for the quality of American Chain products are proud of the results of their work. To them every American Chain fitting must be designed to do a job and do it well—made for safety as well as efficiency.

When you think of welded or weldless chain or chain fittings, think of AMERICAN—"*the Nation's chain maker.*" When you buy chain, buy AMERICAN, the *complete* chain line.

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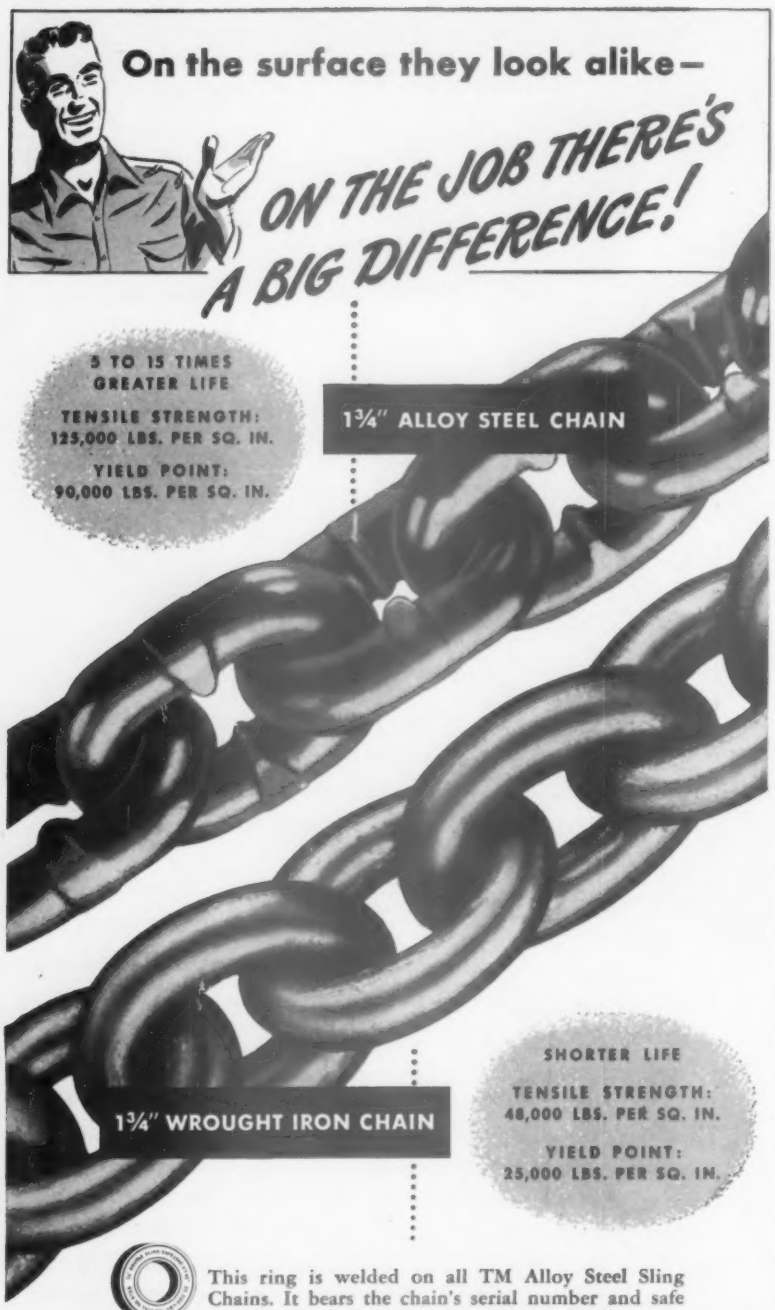
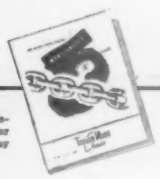
AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety


On the surface they look alike—
ON THE JOB THERE'S A BIG DIFFERENCE!
5 TO 15 TIMES GREATER LIFE
TENSILE STRENGTH: 125,000 LBS. PER SQ. IN.
YIELD POINT: 90,000 LBS. PER SQ. IN.
1¾" ALLOY STEEL CHAIN
1¾" WROUGHT IRON CHAIN
SHORTER LIFE
TENSILE STRENGTH: 48,000 LBS. PER SQ. IN.
YIELD POINT: 25,000 LBS. PER SQ. IN.

This ring is welded on all TM Alloy Steel Sling Chains. It bears the chain's serial number and safe working load limit. In effect it says: "When your lifting requirements are big and your present chain performance leaves something to be desired—it's time to switch to TM Alloy Steel Chain." It's tougher... safer and far more economical than ordinary wrought iron chain. Used by steel, automotive, petroleum, marine and manufacturing industries generally, because *comparison, experience and costs proved its superiority.* For all the facts, write today for free copy of new booklet; "TM Alloy Steel Chain". The S. G. Taylor Chain Company, 93 141st St., Hammond, Indiana.



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A GREAT NAME IN
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The Safety Library

Recent books, pamphlets and periodical articles for safety men.

BOOKS AND PAMPHLETS

Rigging

Handbook of Rigging, by W. E. Rossnagel. Published by McGraw-Hill Company, New York. 321 p. Price $4.75.

This book will fill a need of long standing and will prove useful to maintenance and safety engineers. It combines all types of rigging procedures and practices that are used in both industrial and construction operations.

While the reader will readily understand that safety has been uppermost in the mind of the author in writing such chapters as fiber rope, wire rope, hoisting chains and hooks, slings, chain hoists and all others, there is a separate chapter that deals specifically with the subject of accident prevention.

This handbook is intended for the professional rigger, who is engaged full time in rigging operations, for the maintenance mechanic in an industrial or power plant who has less frequent hoisting and rigging jobs to perform, for the operator of cranes, derricks, and hoists, for the painter who has scaffolding to rig up, and for the foreman and the superintendent who are supervising rigging operations.

Very complete coverage is given to the subjects of ladders and scaffolds, including a chapter which completely discusses the subject of wood for structural purposes. It goes into detail as to the defects and other characteristics that affect the strength of wood. Compression failures, one of the most hazardous defects in structural wood, is discussed and a method of detecting such failures by the application of carbon tetrachloride to the surface, a method suggested by the Forest Products Laboratory, is given.

The controversial question of testing scaffold planks is fully covered in a separate chapter where emphasis is placed on the safest method, which is to have a competent inspector make a careful visual inspection of all faces and the ends of each plank, looking for oversize knots, splits, compression wood, compression failures, brash wood, shakes, and decay. If a load test is indicated, a thorough discussion of the methods to be used is included in this chapter.

A chapter on the procedures in caring for the injured is included, plus a very complete listing of various reference codes, laws, and standards.

Robert L. Moore

Dust Explosions

Pressure-Relieve Capacities of Diaphragms and Other Devices for Ventive Dust Explosions. Published by U. S. Bureau of Mines. 1950. 15 p. Available from Bureau's Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. Free. (Report of Investigation 4636)

Fire Protection

Effect of High Pressures on the Flammability of Natural Gas-Air Nitrogen Mixtures. Published by U. S. Bureau of Mines. 1949. 16 p. Available from the Bureau, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. Free.

Some Studies in Chemical Fire Hazards. By R. J. Douglas and C. E. Thompson. Published by Oklahoma Engineer of Experiment Station, Oklahoma Agricultural and Mechanical College, Stillwater, Okla.

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Safe Handling of Radioactive Isotopes. Published by National Bureau of Standards, 1949. 30 p. For sale by the Superintendent of Documents, Washington 25, D. C. Price 15¢. (Handbook 42)

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Construction

Construction Management Does the Job. (In Engineering—News Record. December 29, 1949. p. 29)

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Safety — Crossing the Imaginary Line. By Alvin Tuten. (In Pulp and Paper Magazine of Canada. December, 1949. p. 152)

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Latest German Extinguishers Incorporate Novel Features. (In Fire Engineering. December, 1949. p. 936)

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Hazards of Glass Forming Machines. (In Sentinel. January, 1950. p. 3)

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Marathon Builds Effective Safety Program. By Howard H. Aderhold. (In Paper Industry. January, 1950. p. 1194)

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Preplacement and Periodic Examinations in Industry Essential for Best Productive Efforts. By Robert B. O'Connor. (In Industrial Hygiene Newsletter. January, 1950. p. 7)

Solvents

Solvent Hazards in Winter and What the Foreman Can Do About Them. (In Supervision. January, 1950. p. 29)

Woodworking Industry

State Helps Woodworking Industries in Eliminating Health and Safety Hazards. (In Industrial Bulletin. New York State. December, 1949. p. 31)

Scores of wires, stranded into 9 parts, then machine woven into an interlaced wire fabric—that is the unique patented construction which gives Tuffy extraordinary flexibility and stamina.

Super TOUGH— On every kind of load, under all kinds of pulls and with every type of hitch, Tuffy Slings have proved their superiority and universal adaptability.

Super-FLEXIBLE— Tie Tuffy Slings into knots, kink them, flatten the eyes. Observe how many more times you can straighten Tuffy Slings out without material damage. Note too, that cutting any one of the 9 parts will not result in stranding the sling.

Tested Strength Twice Safe Working Load Limit

Each Tuffy sling is proof-tested to twice the safe working load indicated on its metal tag. Tuffy's interlaced construction makes possible eye splices averaging 95% of fabric strength.

9 Types-Factory Fitted or Unspliced on the Reel

Try any one of the 9 factory packaged types—for choker, basket or bridle hitches. Prove to your own satisfaction their money saving worth to you. Or, if you're rigged for splicing—Tuffy interlaced wire sling fabric is available on the reel.

union Wire Rope corporation

2224 Manchester Ave., K. C., Mo. Send Tuffy Sling details.

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CITY_____ STATE_____

Fiber Rope

FIBER rope continues in wide demand in industry for block and tackle work and for hoisting and suspending scaffolds and staging. The best fibers have good tensile strength and resistance to weather and abrasion. Fiber rope can be tied and spliced easily and its flexibility makes it preferred for many uses.

Fiber rope should never be subjected to high temperatures or exposed to acid or acid fumes. Sharp bends should be avoided. Where a sling passes over sharp edges, corner pads should be used to protect the rope.

Vegetable fiber, even under favorable conditions, deteriorates with age, and rope should not be kept in stock for long periods. Where rope is used only at long intervals, this factor should be considered in its use and retirement.

Types of Fiber

Manila fiber is standard for tensile strength and durability. A good grade of manila rope, when new and clean, is hard but pliant, yellowish in color with a silvery pearl luster. When drawn through the hands, it has a smooth, almost silky feel. It was extremely scarce during the war, but manila fiber of pre-war quality is again on the market.

Sisal is the next best fiber. Strength varies from 65 to 85 per cent of manila. Sisal rope has a yellowish color, with sometimes a slight greenish tinge. It lacks the gloss and smoothness of good manila. Sisal fibers are stiff with a tendency to splinter.

Mexican sisalana (henequin) lacks the strength of high quality sisal but has been used to some extent during the shortage of better grades of rope.

American hemp fiber is much softer than manila. It has a dark gray color. It is not highly resistant to abrasion but when tarred it will give fair service on some jobs.

Jute and cotton. Not recommended for handling material or other usage where strength and durability are needed.

Synthetic Fibers

Nylon. This versatile fiber has a high rating for tensile strength, toughness, flexibility and durability. It is easy to handle.

Nylon rope has a higher tensile strength, wet or dry, than natural fibers and does not show marked deterioration when frozen. Melting at 480 degrees F., it can be readily destroyed by fire but it does not ignite and burn with flame. It is unaffected by rot or mildew. Attacked by acids but resistant to alkalis.

Because of the complicated process of manufacture, the initial cost of nylon rope is high. Large scale production may decrease the cost but the price is not likely to approach that of vegetable fibers.

Glass. High strength when dry but low resistance to flexing and abrasion. Poor performance when wet reported.

Saran. Resistant to rot and many chemicals. Practically unaffected by aging, direct sunlight and moisture. Only moderate resistance to abrasion and temperature.

Care of Rope

Kinking is highly destructive to rope. It may cause hidden damage that will result in failure when the rope is again put under strain. Kinking is more likely to occur when rope is wet because of shrinkage due to swelling of the fibers and consequent shortening of the lay.

New ropes should be uncoiled by laying the coil on the floor with inside end down; then reach down through the center of the coil and pull this end up, unwinding the coil counter-clockwise. If the rope uncoils in the wrong direction, the coil should be turned over and the end pulled out on the other side.

Sometimes ropes become kinked after use. One method of removing these kinks is to open up the coil and recoil left-handedly. When the coil is completed, the free end is brought through the coil and the rope is then coiled right-handedly. Uncoiling the rope and stretching it out in a single length is another method, where space permits.

Rope should be stored in a dry place where it will not be exposed to high temperature and where air may circulate through the coils.

Rope will deteriorate very quickly if it becomes saturated with water and is not properly dried. Alternate wetting and drying will also cause rapid deterioration.

REFERENCES—SECTION 3

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Wire Rope, Simplified Practice Recommendation—No. 198-43.

Electric Industrial Truck Assn.:
Material Handling Handbook.

Handling Material Principles

Handle materials in large units.

A two-wheel hand truck is better than a man's hands, a four or six-wheel hand truck is better than either, but a lift-truck pallet combination is the most efficient system for many jobs.

Avoid rehandling.

Everytime you pick up materials and put them down again, it costs money. Arrange your system so that you handle goods as little as possible. Processing motion adds value to a product; handling motion adds only to cost.

Balance men and equipment.

Assign no more men and no more equipment to a job than needed. Equipment sets the pace for men, not men for equipment.

Select equipment suited to the job.

Study your operations. Find out exactly what equipment is needed and standardize on that. The nature of your facilities, floor load capacity, ceiling height, volume of material to be handled, intermittent or steady flow, commodity characteristics, and strength for package all have to be considered.

Move materials in a straight line.

The flow of materials should always be toward destination. Lay out work areas so that back and cross hauling are held to a minimum. If you have a storage operation, study your item frequency rate. Items with the greatest activity should be warehoused nearest to entrances and exits.

Industrial Panel

(From page 5)

7. Design of pallets.
8. Design and capacity of stock racks and safe heights for piling.

We have found through experience that close teamwork between our safety organization and all departments, such as plant layout, process engineering, design, experimental and research, and production management, leads definitely to a better and safer plant.

The success of this plan depends on the safety organization using good judgment in entering into new layouts where safety is definitely a problem. Much confusion and misunderstanding can be avoided by cooperation during preliminary plans.

MR. STEEL:

First, I want to explain that I am not a graduate engineer. My position with my company is "safety director" and I am a member of the production staff department working under the vice president in charge of production, engineering, and traffic. We have our own engineering department whose members are specialists in our field, which is grain handling equipment.

Frequently in planning new buildings and new equipment, members of the engineering department will consult us for ideas and opinions, but we leave the engineering work entirely up to the engineers. Throughout the years that we have been promoting safety within our company, we have tried, and we feel that we have been successful, to emphasize the importance of safety in every plan and blueprint as well as in every production order or instructions.

Just recently our company went into a new field—processing soybeans with a petroleum product very similar to naptha. This, of course, has brought in entirely new problems in the matter of explosion-proof equipment, design of buildings, ventilation, etc. Our fire-prevention specialist was called in on many of the preliminary planning meetings in this connection, but it was encouraging to know that the head of our engineering department and everyone else concerned was tremendously interested in the safety problem, and as a result we have, from a design standpoint, possibly the safest solvent extraction plants in the country.

In our company the safety department is not a big censoring department that goes over every blueprint with a fine tooth comb. It is more of a promotional department continually promoting the idea of safety to all departments.

—*To page 138*

Unbreakable **ACID HANDLING UTENSILS**

BUCKETS—3 and 5 gallon. Small top on 5 gallon to minimize splash.

DIPPER—2 quart, convenient handle.

MEASURES—2, 4 and 6 quart. Pouring lips and convenient curved tipping handles.

FUNNEL—10" diameter; handle and eye.

CLOSED TYPE CONTAINER—1, 3, and 5 gallon. For safe transporting of solutions without danger of splashing or spilling.

LONG SPOUT CONTAINER—5 gallon. 14 inch curved pouring spout, hood, tipping handle. Protects employee where reaction is expected.

The safest utensils made for handling acids, alkalis, and other corrosive solutions. Perforated steel core, all-welded construction. Seamless rubber coating—inside and out. No metal exposed. Rubber wedded through perforations prevents separation from metal.

Write for Catalog

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FOR GREATER SAFETY!
Wedglok
PATENTED
CONNECTING LINKS
SAFETY • STRENGTH • SIMPLICITY • ENDURANCE

Combination sling of wire rope and chain connected by Wedglock safety links

A vastly improved connecting link that combines safety with unique simplicity in assembly. Its strength exceeds the published strength of comparable alloy chain . . . assembles rapidly without the use of special equipment.

WEDGLOK is widely used in steel mills, foundries, structural fabricating plants and other material handling operations in which on-the-spot replacement of links is important.

Regular and pear shape. Sizes ⅜" to 3".

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Efficient easily operated lift truck.
Cannot be cornered.
Will not block aisles.
Easy pulling.
Non-flying handle.
Full cargo deck.
Easy steering.
Sealed ball bearings.
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Carboy and
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Pumps — Siphons
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Gloves — Helmets
Hoods — Mittens
Shields — Sleeves
Suits

Send for the latest copy of GARDWELL Catalog Showing our Complete Line of Safety Clothing and Equipment.

Safety CLOTHING AND EQUIPMENT Co.
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PHONE EN[illegible] 1-1722

Industrial Panel

(From page 137)

As a result of this policy, every member of our engineering department is a safety engineer, and that is where the safety engineering really belongs. Likewise, every plant superintendent and every foreman is a safety director for his own department and that's where production safety belongs.

MR. WOODWARD:

Our safety program is firmly based on the conviction that accident prevention is a necessary element of good engineering and also of good industrial management. Therefore, responsibility for safety in design as well as safety in operation is definitely placed upon the regular constituted engineering organization and the regular established line operating organization.

The safety department is set up as a staff function. Its purpose is to advise, recommend, and promote the interest of accident prevention through the existing organization. It might be compared to a consulting service which is available to the organization on the specialized subject of safety.

In view of this basic management policy, all basic plant improvements are planned with consideration of the human safety factors. Such consideration is required by the executive responsible for the project. In a great many instances, the safety department is called into consultation when the first sketches are made. This consultation then continues through the development of the plan and the drawings are marked with approval by the safety department.

While we have not made it mandatory that such safety department approval appear on all layouts, drawings, etc., the trend is in that direction, simply because the executives responsible for such projects know that they are held responsible for the safety of the operation and will be directly responsible for any accidents which may result from unsafe conditions.

This approach has resulted in a number of related activities. For example, designers are represented in certain specialized safety committees which deal with the problems of certain types of equipment. They are called in to accident investigations which involve equipment which has been planned or designed by them. It is becoming a practice for engineering designers to spend more time in the plant observing the operation of equipment which they have designed with a view to improving its operation both from the safety and efficiency standpoints.

We feel that this method of control is more satisfactory than establishing a rigid requirement for safety department approval of every project. When a safety director insists upon approving every plan or design, he is inviting a certain amount of "buck passing," because he is removing from the designers a responsibility which should be a basic part of all good design and engineering.

How Much Can a Worker Lift?

Safe lifting limits depend upon the physique of the individual worker. Some states have established codes limiting the load a worker may be required to lift in repetitive operations. These codes differ widely.

The U. S. Department of labor has set up the following weights as within safe limits for male and female workers for continuous or repetitive lifting operations. These loads are in compact form:

Male workers—50 pounds.

Female workers—25 pounds.

All workers required to lift and carry objects should be instructed in proper methods. When large quantities of even relatively light materials must be handled, mechanical handling may be desirable.

MACHINE GUARDING and OPERATION

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Guards for the Machine

SOME TYPES of machines can be guarded with devices commercially available; others require guards of special design.

Standard guards for such machines as power presses, cricular saws, paper knives, etc., are adaptable to a wide variety of sizes and types of equipment.

Many modern machines are designed to be equipped with guards built in by the manufacturer. Usually this is less expensive than having custom built guards added when the machine is installed. Lack of uniformity of regulations throughout the country has retarded this development but some groups of manufacturers are cooperating in developing acceptable standards.

Some types of guards, in addition to protecting the operator, actually increase production. This feeling of security lessens the concentration on avoiding injury that often results in fatigue.

Point of operation guards may increase efficiency in other ways. An enclosure guard may serve as a container for objectionable dusts, or as a trap for materials that can be salvaged. It may prevent splashing oil or flying particles.

Installation of a guard requires consultation of a number of persons to insure not only safe but also practical design. The cooperation of the foreman and operator will be needed in securing acceptance and use.

Oilers, maintenance men, electricians, millwrights and others who work with the equipment should understand the importance of the guard and the need for replacing it before the machine is put in operation after servicing.

Insurance company engineers, state factory inspectors and others must often approve guard designs. Since state codes are not always uniform, and since they generally represent only minimum requirements, American Standard codes should be followed.

Guarding obvious hazards is not always enough. Passersby, maintenance men and others must be considered as well as the operator. The only safe way is to assume that some employee is likely to do the unexpected at any time.

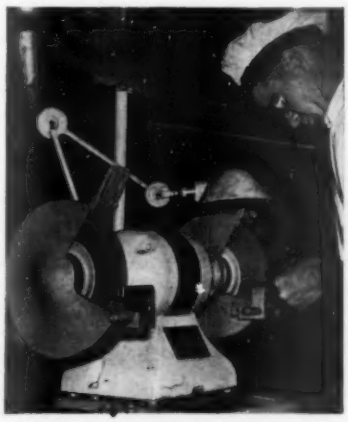
Point-of-Operation

Guarding the point of operation is usually more complicated than enclosing power-transmission apparatus.

Point-of-operation guards are installed at those parts of machines where cutting, shaping or forming is performed, and at other points where there may be a hazard to operators inserting or manipulating stock.

Guards should protect operators both from moving machine parts and from moving materials. This may be done by safeguards of the following types:

1. Mechanical feeding and ejecting devices.



Guards, toolrests, goggles and functional use of color are safeguards on this grinding wheel. (United Air Lines).

2. Two-hand control devices.
3. Redesign of machine parts so that it is impossible for the operator to get into the danger zone.
4. Devices that interrupt movement of tools or machines, while any part of the body is in the danger zone.
5. Devices that pull or push the operator's hands away from the danger zone.
6. Barricades, covers, hood guards and other enclosures.
7. Interlocking devices.

Machine parts are sometimes adjusted to minimize the hazard of operation, as in limiting the stroke on a punch press so that the fingers cannot enter between the dies.

Few types of guards will provide 100 per cent protection. For instance, an automatic or dial feed on a punch press may make it unnecessary but not impossible for an operator to place his hands in the danger zone.

Frequently an operator is injured because he cannot resist the impulse to straighten a misplaced part just before it passes under the ram. Therefore, automatic feed, plus a substantial enclosure which completely isolates the point of operation, provides much safer operation, especially on slow-moving presses.

Automatic feeding and ejecting devices, enclosure guards, sweep guards, hand or arm "pull-back" guards, and stroke limitation, are among the means used to control the hazard of power press operation.

On punch and forming presses it is frequently necessary to install guards of a different type for each set of dies used. For this reason, enclosure guards should always be considered integral parts of the dies.

Hood enclosure and cover guards are used on woodworking machines and many other types of equipment. Frequently, such guards are automatic in action. Others are of rigid construction.

Serious nip hazards, such as rubber

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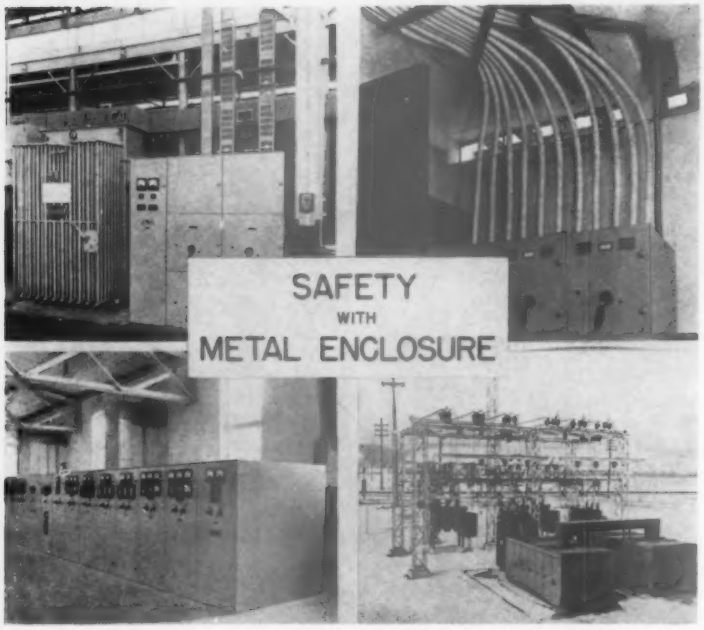
Section 4—Machine Guarding and Operation

Electric Equipment



Examples of safeguarding electric equipment with metal enclosure. (General Electric Company.)

FEW developments of modern industry have contributed so much in greater cleanliness and efficiency, and in many cases, safety, as has the almost universal use of electricity.

The flexibility of electric power permits installation of motors on individual machines, or in strategic places for driving groups of machines. This has made it possible to dispense with shafting, belts and other transmission equipment, bringing great improvements in lighting, ventilation and housekeeping.

However, there are certain hazards connected with the installation, maintenance and use of electric wiring and generating and utilization equipment. Unless well known precautions are observed, new hazards may offset those removed by use of electric equipment.

Control of most of these hazards is not difficult or expensive. Precautionary measures developed and approved by industry will control most of the electrical hazards in industry, if applied.

Safety guides for the use of electric equipment are given in numerous publications, including the National Electrical Safety Code, which deals with prevention of injuries, and the National Electrical Code, which deals with fire protecting measures. Electric equipment which has passed exacting tests and bears the approval label of recognized testing laboratories is available.

Installation. Equipment should be installed by qualified engineers and electricians. When building alterations or rearrangement of machines is necessary, only qualified electricians should do the electrical work, which should comply with applicable codes and standards.

Transformers, control boards, starting rheostats, and other apparatus should be placed where there is the least danger of accidental contact with energized conductors. All exposed current-carrying parts should be further protected by enclosures, railings or special guards.

Motors should be mounted so as not to interfere with normal plant traffic. Non-enclosed type motors should be located in areas relatively free from dust, moisture, or corrosive vapors.

Isolating Equipment. When practicable, transformers, control boards and other accessories should be placed in special rooms to which only authorized persons have access.

If a separate room is not feasible, enclosures should be built around equipment having exposed conductors. Enclosures made of metal should be effectively grounded.

Barriers may be used to prevent accidental contact with electrical equipment. Frames may be made of wood, rolled metal shapes, angle iron or pipe. Filler may be of wood-strips, sheet metal, perforated metal, expanded metal, wire mesh, or shatterproof transparent material.

Some protection can be obtained by elevating wires and current-carrying parts at least eight feet above any working level to which employees (other than qualified electricians) have access. Where long metal parts, such as rods, bars and pipes are handled, partial enclosures or barriers should be provided to prevent contact with overhead electrical installations.

Warning signs should be displayed near exposed current-carrying parts, especially high-voltage installations.

Many standard machine-guarding practices apply to electric equipment, but there are certain hazards peculiar to electricity. Particular attention should be given to the **National Electrical Safety Code** and the **National Electrical Code.**

Protective Grounding is necessary for exposed non-current-carrying metal parts if the equipment is supplied by means of metal-clad wiring, when installed in a wet location, and when it operates with any terminal at more than 150 volts to ground. Parts to be grounded include motor frames, cranes, cases of transformers and oil switches, wiring conduit, and metal lamp sockets.

Frames of all portable motors which operate at more than 50 volts to ground should be grounded.

Motors should be of the type and size required for the load and for conditions under which they must operate. Overloading over long periods, use of non-approved motors in areas containing flammable vapors or dusts, and defective wiring should be avoided.

Protect motor windings from metal particles, dirt, dust, lint or other materials which may damage the windings or become ignited. In areas containing flammable materials, such as dusts and gases, motors designed for hazardous locations should be installed. The *National Electrical Code* should be followed.

Grounded metal enclosures are recommended for starting rheostats, switches, fuse panels, and other operating accessories. In some devices, both switch and fuses are enclosed in a cabinet so arranged that the switch can be operated without opening the cabinet. The switch is interlocked through a cam so that the fuses are inaccessible until the switch is opened.

Another type of enclosed switch permits the door of the cabinet to be opened with a key, even though the switch is closed. With either type of cabinet, it is possible to padlock the door open or closed, and the switch can be padlocked in the open position.

Maintenance and repair work should be done only by qualified engineers or electricians. When repair work is being done on motors, their controlling devices, or the machinery they drive, the circuit should be de-energized by opening the necessary switches and locking them in the open position.

If a switch cannot be locked open, it should be blocked and a tag at-

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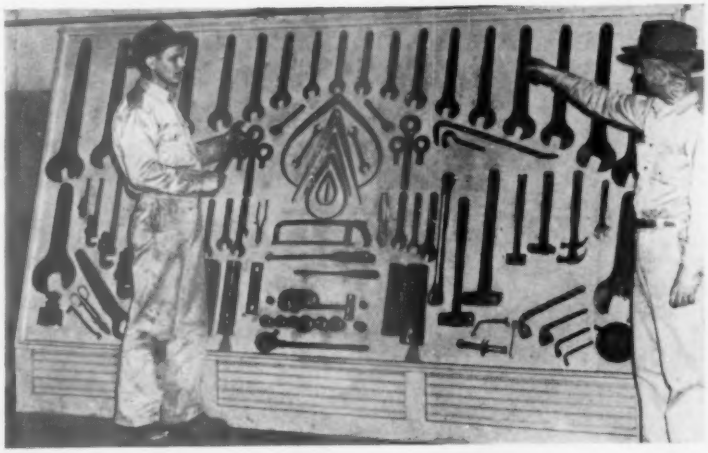
Hand and Power Tools



Missing or defective tools are quickly spotted when tools are kept on a display board. (Gulf Refining Company.)

HAND TOOLS, because of their relatively low cost and deceptive simplicity, are not always treated with the respect they deserve. They are involved in approximately 10 per cent of all disabling injuries in industry, as well as in many minor cuts and bruises that receive only first aid treatment. These slow down work and are potential infection cases.

Types of tools. The following types are commonly used in industry:

1. Metal cutting — Cold chisels, marking tools, bull chisels, hack saws, tin snips, cutters.
2. Wood cutting—Chisels, gouges, saws, axes, adzes, hatchets, knives, brad awls.
3. Lifting — Levers, crowbars, jacks, hooks, shovels.
4. Torsion—Wrenches of various types, pipe tongs, screwdrivers, pliers.
5. Striking — Hammers, sledges, mauls, picks, punches.

Some tools belong in more than one classification. An axe, for example, is both a cutting and a striking tool.

Accident causes. One or more of four primary causes are responsible for injuries with hand tools:

1. A wrong or improvised tool: a file or screwdriver for prying; a wrench for hammering.
2. A defective tool: a burred chisel head; a dull saw or knife; a split maul handle; a tool of poor quality.
3. Tools incorrectly used: striking two hard-surface tools together; failing to take practice swing with sledge to adjust for clearance; pulling on pliers in line with face.
4. Tools not put away: wood chisel loosely laid in tool box; hammer left on edge of machine; knife left on table.

Purchasing. Standard tools for routine and special work should be kept in stock or readily available. High grade tools are the best buy and the difference in initial cost is offset by longer life, reduced upkeep and lessened risk of accident.

Suitable arrangements should be made and responsibility placed for the purchase, handling and care of tools. The purchasing department should be kept informed of tool performance as a guide to future purchases.

Alloy steels have advantages where the need for strength and toughness combined with light weight justifies the higher cost. Alloys are used for hammers, wrenches, screwdrivers, wood working tools, pliers, rivet sets, saws, knives and punches.

Some alloys offer resistance to mushrooming and chipping but no tool should be subjected to unnecessarily rough use.

Non-ferrous hammers or mallets should be used for striking tempered or case-hardened tools. These hammers are usually made of copper, lead, bronze, brass, rawhide or wood.

Handles. With hammers, sledges, axes, picks, etc., the greatest strain is where wood and metal join. An adequate supply of good handles should be kept in the toolroom. These should be straight-grained wood, free from slivers, preferably hickory, ash or maple. Handles should be fitted by an experienced person.

Insulated tools. For working around electric equipment, tools with insulated handles are frequently used. These provide desirable protection but are not a substitute for rubber gloves and other protective devices around energized equipment.

Marking tools. Steel stamps and holders for stamping identification marks on machine parts and other metal surfaces are available in alloys which resist mushrooming and do not chip readily.

Car movers. For moving cars on rails, several types of car movers are available. These are safer and more efficient than crowbars for this work.

The Tool Room

Safety and efficiency in tool control often result from installation of a tool crib with a competent attendant, when enough tools are handled. In addition to routine checking in and out, the attendant can see that workers obtaining such tools as mauls, cold cutters and drills also have goggles for the job.

Tools showing signs of abuse on return can be brought to the foreman's attention so that bad practices by users can be corrected.

Display boards are often used for maintenance and repair tools and do much to encourage return of tools. In other plants, racks or bins which can be moved to the work area are used. These require periodic checking to see that tools are in good repair.

An individual workman's tools should be kept in a box or rack convenient to his work area. The box should have designated places for such things are wire brushes, chisels, saws and knives to avoid exposing sharp edges.

Inspection. Permissible wear limits for tools should be set up as a guide for inspection when they are returned to the crib. Lacking such standards, the attendant or inspector should be qualified to pass on the condition of the tool for future use.

—*To page 147*

ELECTRIC HAND TOOLS

(Suggestions in Using)

1. Keep tools in good condition, cleaned, oiled and repaired.
2. It is good practice to use an extra wire to ground the tool casing when in use, if one has not been built in.
3. Use only approved and inspected extension cord.
4. Always examine both the cord and connections carefully before using. Damaged cord and defective plugs and switches may be dangerous.
5. Never hang an extension cord over nails or other sharp edges; or allow it to become kinked; or leave it where a truck may run over it. Wire or insulation will be damaged.
6. Protect the cord against contact with oil, hot surfaces, and chemicals. These may damage the insulation.
7. It is bad practice to patch any serious injury to cord insulation with tape. Shorten the cord or get a new one.
8. Wear goggles while using electric hand tools if there is any danger of flying particles.
9. Do not use a portable electric tool in the presence of flammable vapors or gases.
10. Store extension cord in a clean dry place where it can lie loosely coiled.

SAFETY INSTRUCTION CARD No. 343

Section 4—Machine Guarding and Operation

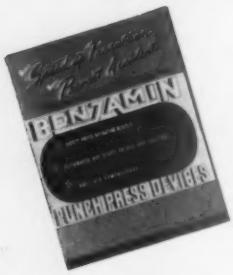
SAFETY without Sacrifice of Speed!

BENJAMIN POWER PRESS DEVICES

1. Operator places work on die with one hand, removing finished part with other. Note clear working space, permitting faster production.

2. Operator places both hands on safety device handles; this trips press and assures that hands are out of danger zone when ram descends.

3. Operator removes finished part; places next part in position for next stroke. An easy natural routine permitting top speed.



Send for this Free Manual. Shows hundreds of manufacturers, large and small, are utilizing Benjamin Safety Devices to help increase safety and improve production. In this manual are contained complete details, installation instructions, diagrams, and how-to-order information.

Years of successful safety experience prove the merit of these devices, prove that safety can be achieved without sacrifice of speed in power press operation. The booklet illustrated at the left describes these three devices:

BENJAMIN PUNCH PRESS SAFETY DEVICE

Keeps Hands out of Harm's Way . . . Eliminates Foot Treadle . . . Speeds Output . . . Inexpensive!

This device eliminates the possibility of accidentally tripping the press while hands are in the way by making it necessary for the operator to use both hands to trip the press! In successful use for over 30 years on practically every make, size and type of press. Introduces no new mental or physical hazards, makes safety a part of the working cycle, eliminating lost motion. Imparts sense of security which enables operator to speed output. Conserves die-setters time because it does not have to be removed or adjusted. All punch press manufacturers will install them on presses ordered or you can order direct and make installation yourself. Underwriters' Laboratories approved.

BENJAMIN AUTOMATIC AIR EJECTORS

Increase Output by utilizing Compressed air to Automatically Eject Stampings, Blow Out Chips, etc.

These ejectors are specifically designed for releasing an accurately timed blast of air of correct volume and intensity for ejecting stampings, blowing out chips, scale, etc. The set consists of the valve, trip and hose. Can be installed on any size or type of press and any machine on which there is a suitable reciprocating or rotating motion for actuating the valve. Operates from your regular compressed air line or by means of the

BENJAMIN UNIT COMPRESSOR

This air compressor is attached to the side of the press or machine and utilizing the action of the press compresses the air required for operation of the Benjamin Ejector. It provides an economical solution to the problem of obtaining a compressed air supply where there is no existing compressed air system. Use of this device is desirable also, where expensive dies are used and in other operations requiring moisture-free air supply. Being self-contained, this device eliminates the possibility of moisture in the air which often develops in long air lines.

Write today FOR THE FREE MANUAL: address the Benjamin Electric Mfg. Co., Dept. U., DesPlaines, Illinois

R-2193 B

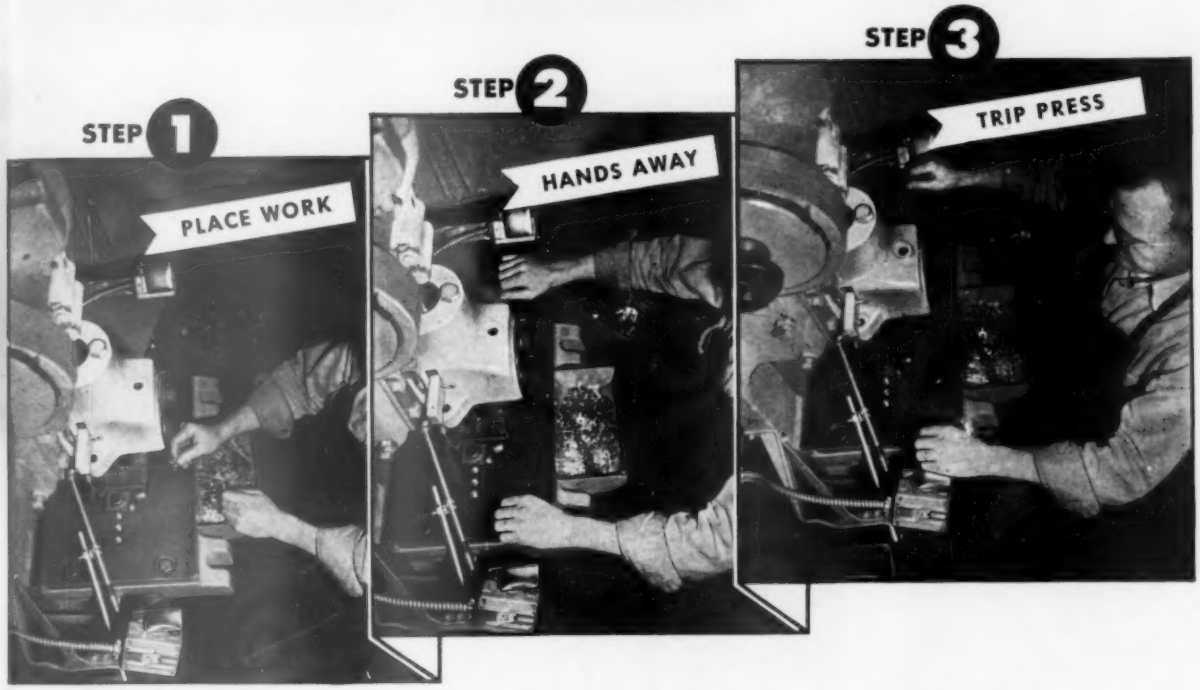
BENJAMIN

TRADE MARK

PUNCH PRESS SAFETY DEVICES • AIR COMPRESSORS AND EJECTORS

MICROTRIP PRESS CONTROL

speeds operation of presses . . . *with safety*



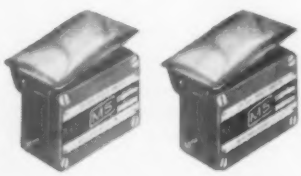
MICROTRIP press control is the two-hand safety device which makes it impossible to operate the control circuit without touching both actuating plates at the same time.

Increased production which MICROTRIP press control makes possible comes from the ease and simplicity of its operation and its instant response.

It's just a matter of placing the work beneath the press ram, moving the arms away from the danger area and lightly touching the MICROTRIP plates.

Operators work more quickly because of assured protection. Fatigue is minimized by the light-touch actuation with which MICROTRIP press control operates.

MICROTRIP is available for multiple-station operation as well. It is easily installed on either old or new equipment. For complete information write MICRO SWITCH, Freeport, Illinois, or contact any branch office.



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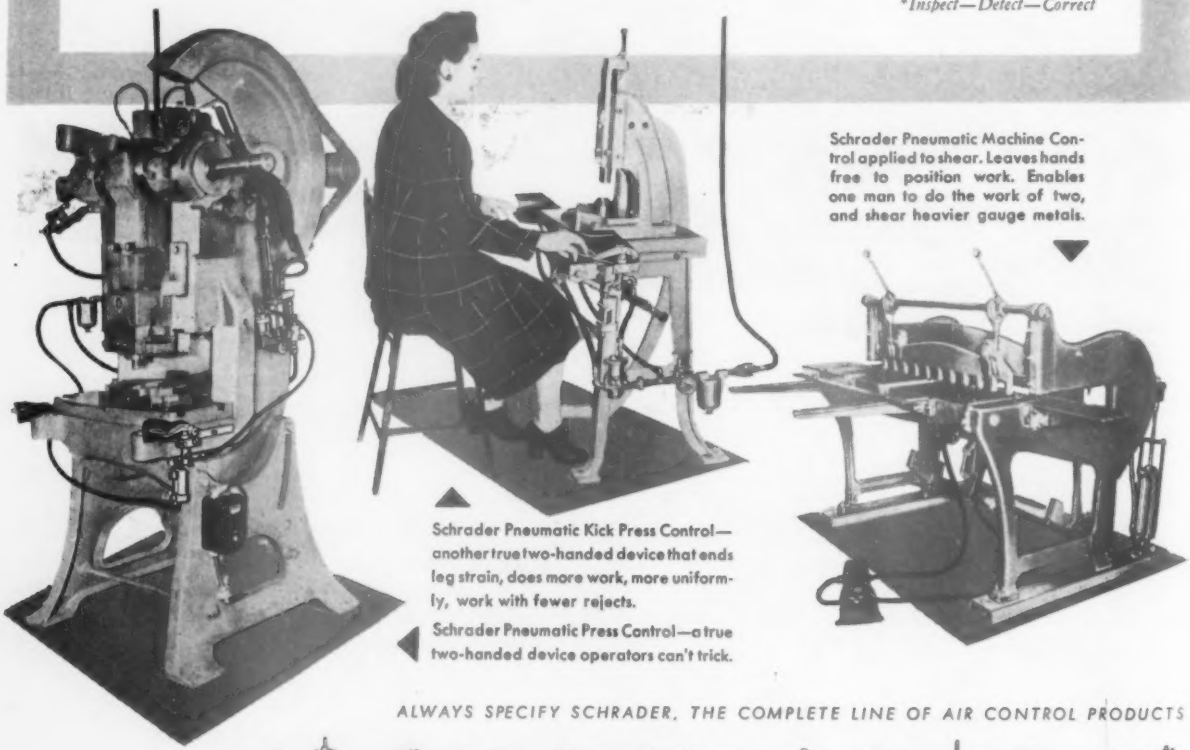

Schrader Pneumatic Machine Control applied to shear. Leaves hands free to position work. Enables one man to do the work of two, and shear heavier gauge metals.

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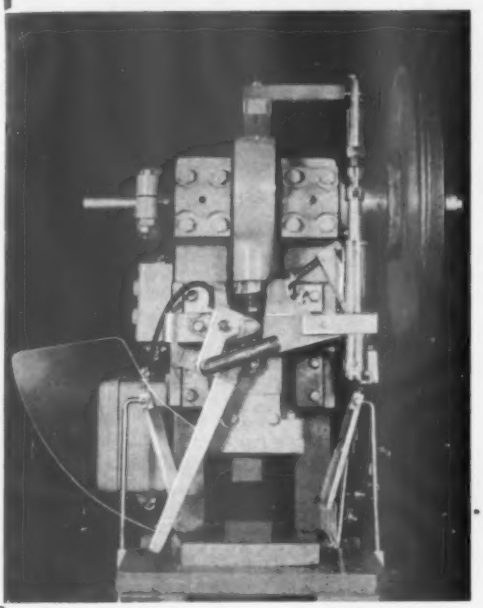

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There never has been an injury where one of our Woodworking Guards was properly used.

The guarding of power presses for 2nd forming or blanking operations is our specialty.

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Tools do not roll off workbench or sloping surfaces as do other shapes.

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Guards

(From page 139)

mills, calender rolls, dough breaks, and others, can be protected by sensitively adjusted controls that operate dynamic brakes when contacted by any part of the operator's body. These guards stop the machine in the shortest possible time.

Two-hand controls are frequently installed on power presses, bakery machinery, guillotine paper cutters, and other types of equipment where barrier guards are not practicable.

Interlocking devices are used on centrifugal extractors, dough mixers, some types of pressure vessels, tumblers and other machines that require covers or barricades in place before the starting control can be operated.

Operators occasionally make safety devices ineffective in an attempt to speed up output or make operation easier. This is especially frequent with two-hand controls. Operators should be warned of the hazards involved and instructed in the use of safety devices.

Frequent checks should be made to see that instructions are observed and that safety devices are functioning.

Materials

Guards for most purposes may be made of bar stock, sheet metal, perforated metal, expanded metal or heavy wire mesh.

Wooden guards are sometimes used where splashes and fumes from corrosive chemicals would attack iron or steel. In such conditions, however, the possibility of exhaust ventilation should be studied. Wood guards have low initial cost, which is offset by high maintenance cost. Wood is com-

Combination blanking and piercing die on power press. Upper and lower shields of clear plastic have ⅛-inch opening for stock. Shields telescope without leaving pinch point. Guards extend around guide post at rear so that it is practically impossible to get hand into die without reaching directly from the rear. (Allis-Chalmers Manufacturing Company.)

bustible and when soaked with oil is easily ignited.

Where resistance to rust or possible damage to machinery is a consideration, guards of aluminum or other soft metal are sometimes used.

Plastic guards are used where inspection of moving parts is necessary and strength is less important. Shatter-proof glass is used in similar situations, particularly where illumination of guarded parts is essential and the flexibility of plastics is not required.

Where flying particles may mar the surface of safety glass or plastics, the surface may be protected by replaceable cover glasses.

Power Transmission

Mechanical power transmission apparatus includes shafting, belting, pulleys, gears, starting and stopping devices, and other moving parts of equipment used in the mechanical transmission of power. Also included are prime movers, intermediate equipment, and other machines.

Compared with other accident sources, power transmission parts contribute a small proportion of the total number of injuries. Nevertheless they are the sources of many permanently disabling injuries, and no hazard should be neglected.

Individual motor drives and modern design with moving parts enclosed have eliminated much guarding on the job. However, some guards must still be built when machines are installed.

Tools

(From page 141)

Periodic inspections of all tool operations are needed to insure efficient control. Inspections should concern housekeeping in the tool crib, tool service, number of tools in the inventory, handling procedure, and condition of tools in general.

Maintenance and repair require adequate facilities, such as work benches, vises, forge or furnace for hardening and tempering, tempering baths, repair tools, grinders, goggles and adequate lighting. Repairs should be done by thoroughly trained men.

An adequate supply of repair parts should be kept on hand.

Non-Sparking Tools

Where there is a possibility that hand tools may strike a spark and ignite a flammable dust, gas or vapor, non-sparking tools are widely used. These tools are made of non-ferrous metals such as aluminum, bronze, brass and beryllium copper.

Non-sparking tools made of these alloys include hammers, chisels, punches, prybars, screw drivers, scrapers, spatulas, picks and shovels. Special tools can be made to order.

Being softer than steel, non-sparking tools are less likely to break off

$75,000 PAINT FIRE GUTS PLANT, KILLS WORKER
One female employee was burned to death, and another broke her leg jumping from a window in a 4-alarm fire which swept the [redacted] Plant, at 40th and Chestnut Streets last night. Property damage is estimated at $75,000
Fire department inspectors blame a spark caused by a steel scraper used to clean a spray booth. Accumulated paint fumes
the disastrous fire which
Highly flammable materials used in
controlling
Cost of Spark
$75,000

AMPCO

Cost of Prevention *only $2.30*

(with an Ampco Safety Tool)

THAT'S why Factory Mutual Laboratories and other safety authorities approve and recommend Ampco Safety Tools for use in hazardous locations. And that's how Ampco Safety Tools help you earn lower insurance rates, and improve workers' morale for greater job efficiency.

HOW TO CHOOSE *Safety Tools*

(From Ampco's complete line of more than 400 standard individual items)

For tools subjected to impact and/or torque — specify tools of Ampco Metal.

For tools with cutting edges and gripping teeth — specify Ampco beryllium-copper.

For jobs around acetylene and certain other gases — specify Ampco tools of Monel Metal (trademark, Int. Nickel Co.)

Send for free Safety Tool Catalog

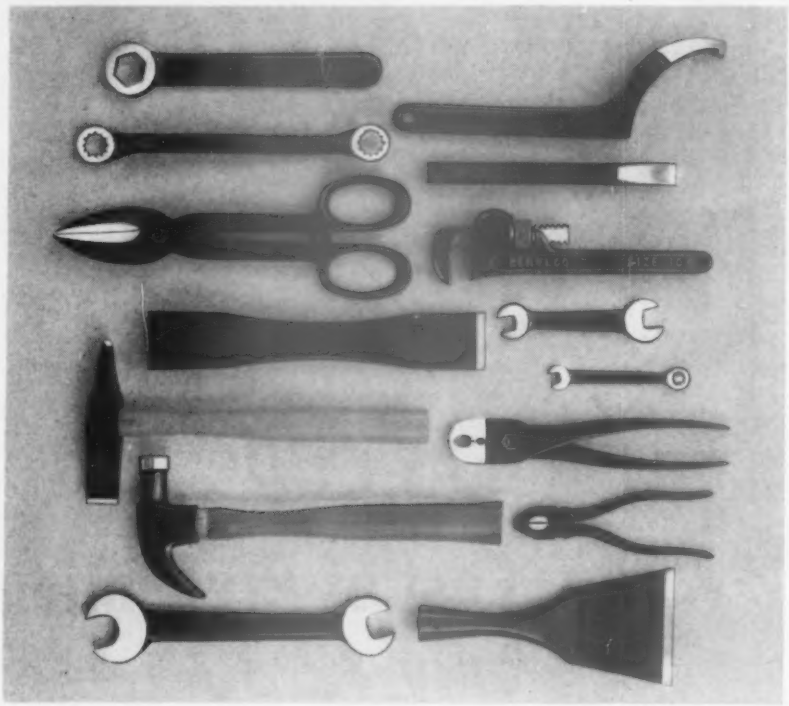
T-3

AMPCO®

Ampco Metal, Inc.

Dept. N53, Milwaukee 4, Wisconsin

West of the Rockies it's the Ampco Burbank Plant, Burbank, California



NO BETTER Insurance . . . . . Fire Prevention with

BERYLCO SAFETY TOOLS

How much is your plant worth? How much would it cost at today's increased costs and how long would it take to rebuild after a disastrous fire or explosion?

You can feel safe with BERYLCO Safety Tools on the job. They are made of high performance beryllium-copper and are highly resistant to sparking. They give you protection on all operations involving the use of inflammable or explosive liquids, gases or dusts. They give you added value in being corrosion-resistant and non-magnetic. And they're strong and tough for lasting service.

Write today for Catalog No. 348 showing the complete line of BERYLCO Safety Tools.

BERYLCO BERYLLIUM COPPER

The **BERYLLIUM CORPORATION**

READING • PENNSYLVANIA

fragments from the metal being worked on by the tool. With continued use, these tools may become impregnated with particles of foreign substances which may cause sparks if not removed.

Non-sparking alloys are relatively expensive and these special tools are used only where there is an explosion hazard.

Portable Electric Tools

General classifications of hand-operated power-driven tools are:

1. Abrasive tools, such as disk and portable belt sanders, polishers, and bench and flexible shaft grinders.
2. Drills.
3. Saws and other cut-off tools, routers, etc.
4. Assembly tools, such as screw drivers, nut runners and tappers.
5. Hammers.
6. Sheet metal shears.
7. Fans.

Portable electric tools are generally designated as:

Light Duty, for intermittent use on light work.

Special duty or **standard duty,** for slightly heavy work or fairly continuous operation.

Heavy duty, for continuous operation and production service or for heavy work.

Safety switches, which operate the motor only while the switch is held in the closed position by the operator, should be used.

Three possible methods of preventing electric shock to the operator are: (1) Prevent electric contact with the shell; (2) Use non-conductive material for the shell and all parts which the operator may handle; (3) Ground the shell by means of a third wire or central grounding.

TOOL KEEPERS
(Important Responsibilities)

1. Issue only those tools that you know to be safe.
2. Permit no tool with a mushroomed head to leave the tool room; have all cold chisels, chisel bars, cutters or other shock tools with bad heads dressed before they are issued.

3. Keep the jaws of wrenches in good condition; warn workers against misusing them.
4. Keep all sharp-edged tools sharp; keep the edges protected while in storage.
5. If any tool shows signs of being improperly tempered, withdraw it from service; try to find the trouble and have it corrected.
6. Portable electric and pneumatic tools should be kept in the best possible condition; check frequently the condition of switches and control valves, electric cord and hose connections.
7. If a grinding wheel has been abused, give it the "ring test." (See Safety Instruction Card No. 108.) Know the safe speeds and how to mount and adjust the wheels.
8. Store grinding wheels so they cannot be abused.
9. When issuing goggles, make sure they are suitable for the work, and that they fit comfortably.

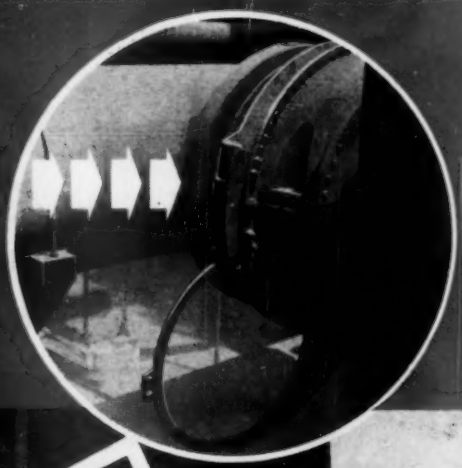
SAFETY INSTRUCTION CARD **No. 136**
Revised Nov., 1936

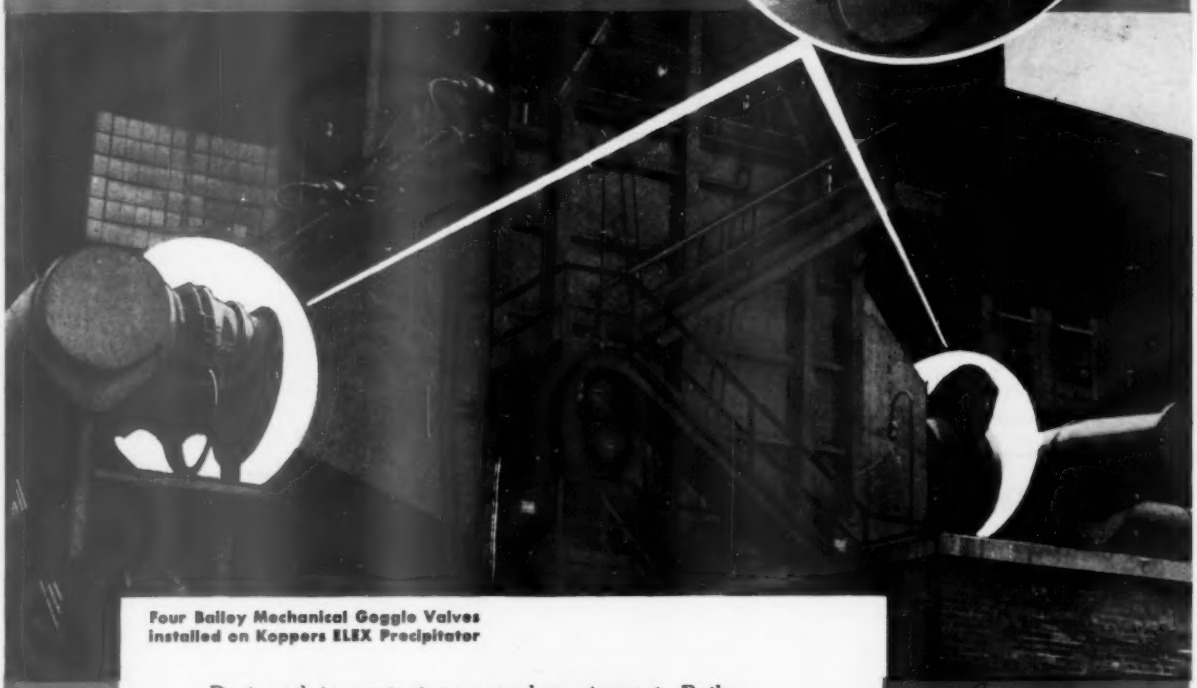
Bailey

MECHANICAL GOGGLE VALVES

add to

STEEL MILL SAFETY!





Four Bailey Mechanical Goggle Valves installed on Koppers ELEX Precipitator

Designed to protect men and equipment, Bailey Goggle Valves provide a sure, positive seal for shutting off gas mains in emergencies or for repairs. The clamping force is applied equally at all points around the periphery of the disc, assuring a tight seal. Bailey mechanical goggle valves require a minimum of maintenance and can be depended upon for safe, instant service when needed. May be totally enclosed if desired. Used for gas washers, blast furnace mains, precipitators, boiler plants.

PLATE IS TIGHTLY CLAMPED IN THE CLOSED POSITION . . . YET INSTANTLY FREED FOR OPENING.

RUGGED, DEPENDABLE, SAFE

Bailey Mechanical Valves are furnished in sizes from 6" to 72". Bailey Thermal Valves are made in sizes from 48" to 120".

WILLIAM M. Bailey COMPANY

ENGINEERS

LEADERSHIP THROUGH QUALITY

1221 BANKSVILLE ROAD PITTSBURGH 16, PA

SAFETY "Luminum Line"
ADJUSTABLE HAND TOOL HOLDER

Prevents Smashed Fingers!

Here's a "Safety" tool that will eliminate a lot of accidents. Made of cast aluminum for light, rugged construction. Tools of various sizes are held in holder by spring pressure—quickly changed. Holder is available in four sizes, to hold tools from ¼" to 1¼" square.

Write for data sheets and prices

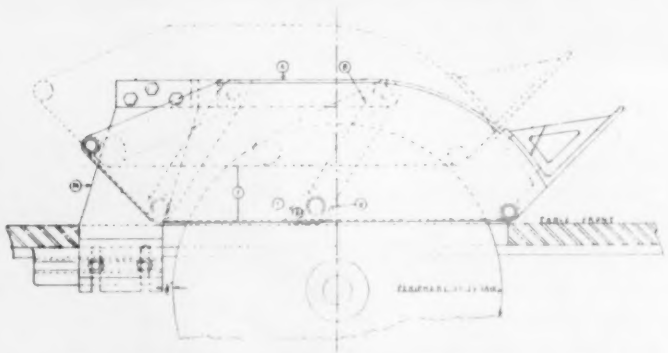
SAFELY HOLDS . . .

- Steel Stamps
- Cold Chisels
- Drifts
- Punches
- Other Hand Tools

M.E. CUNNINGHAM CO.
SAFETY STEEL STAMPS

200 East Carson Street · Pittsburgh 19, Pa.

THE "BEST-GUARD"



(A) Body of the guard is made of 18 gage .050 steel and incorporates ventilating slots. Splitter is of hardened and ground spring steel.

(B) Exclusive lifting mechanism comprises four (4) off-set suspension links which fulcrum on a double overarm supporting member. Angle of links in the guard's closed position minimizes undesirable backward movement and takes advantage of maximum lifting range. We wish to stress the fact that in the "BEST-GUARD" the possibility of "sticking up" (an inherent fault in many guards) has been reduced to a minimum.

(D) Cast one piece aluminum nose has long angular plane permitting the insertion of material up to 5".

(H) Double anti-back lash dogs seize work on both sides of saw.

(I) Dogs may be locked in inoperative position by use of small washer.

Dealers' inquiries invited.

GATEWAY DIE & TOOL COMPANY
Products Manufacturing Division
332 Copeland Avenue — La Crosse, Wisconsin

Electricity

(From page 140)

tached showing that the switch is to be closed only by the man whose name appears on the tag. Warning signs should be displayed.

Wiring depends upon the type of building construction, the size and distribution of electrical load, exposure to dampness or corrosive vapors, location of equipment, and other factors. For most plant conditions, rigid metal conduit, effectively grounded, is satisfactory.

Other methods which may be used under certain circumstances include armored cable, non-metallic sheathed cable, flexible metal conduit, raceways, open wiring on insulators, and concealed knob and tube wiring. National and local wiring codes should always be observed.

Over-Current Devices

Over-Current Devices, such as fuses or circuit breakers, should be installed in every circuit. Protection of this kind, both for personnel and for equipment, is important. These devices open the circuit automatically in the event of excessive current flow due to accidental ground, short circuit, or overload.

Types of fuses include link, expulsion, plug and cartridge fuses.

A link fuse is a strip of fusible metal between two terminals of a fuse block. If exposed, it may scatter hot metal when it blows.

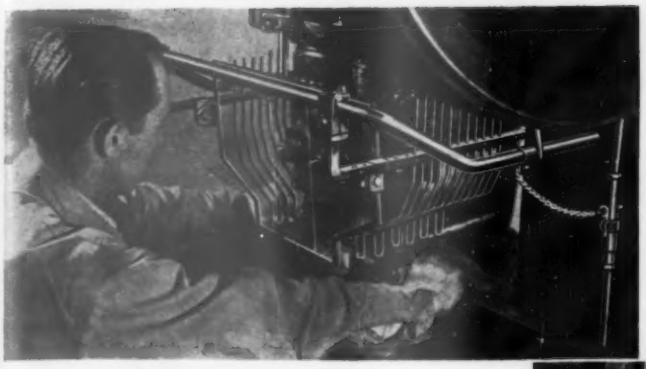
Expulsion fuses are for use in central stations, power houses or on overhead lines. They are so designed that when they blow the gases generated aid in quenching the arc.

Plug fuses are used on circuits which do not exceed 30 amperes at not more than 150 volts to ground. The type which cannot be bridged inside the holder is recommended.

Cartridge fuses have fusible metal strips enclosed in fiber tubes. Those which indicate when the fuse is blown and the refillable types in which fusible elements may be replaced are available.

Where practicable, fuses should be protected by a switch which will make the fuses dead when opened. Insulated fuse pullers should be kept on hand for pulling and replacing fuses.

Circuit-breakers are used in high voltage or large current capacity circuits, and are becoming more common in many kinds of circuits. They may be instantaneous in operation, equipped with timing devices, manually operable, or power operable. Circuit breakers for any installation

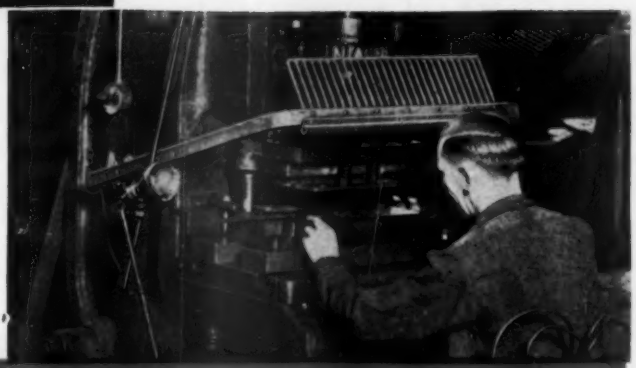


Yours TO BE SURE

● Junkin Safety Guards for presses are backed by more than 30 years' experience in the metal stamping field . . . and are based on sound engineering principles that combine all the features essential to safe press operation.

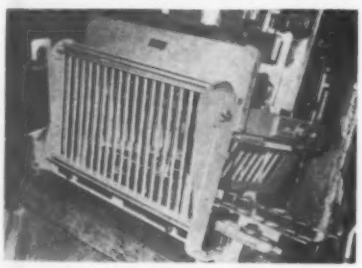
The two types of Junkin Guards shown here are adaptable to virtually all types of presses and satisfactory service is assured for the lifetime of the press.

If you would like the facts about Junkin Safety Guards, write us. There's no obligation.

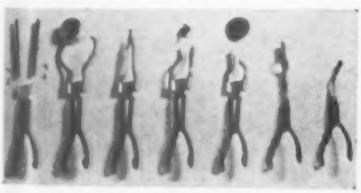


JUNKIN SAFETY APPLIANCE COMPANY, INC.
930 WEST HILL STREET ● LOUISVILLE, KENTUCKY

POWER PRESS SAFETY



Blanking and cutoff operations can be done with greater speed, without danger to the operator with the "Safe-Play" Die Enclosure. Of sturdy steel construction, it provides better vision, adaptability and accessibility for clearing, oiling and cleaning.



Protect operator's hands on punch presses by using "Safe-Play" ALUM. jaw punch press pliers, wherever a hand is endangered.

THE "SAFE-PLAY" CO.
3364 W. Hopkins St., Milwaukee 9, Wis.

IPCO PUNCH PRESS FEEDER

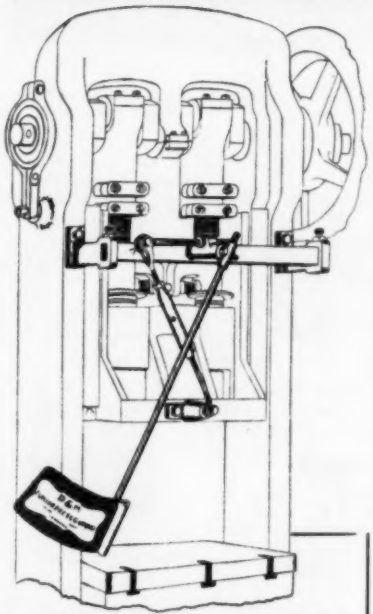
Write for Bulletin K-30B

A speed-up tool for lifting, feeding and positioning blanks of metal and other materials in stamping machines and die presses without inserting the hands or fingers within the danger zone.

Used for separating sheets, transferring from piles or stacks . . . many other uses on all non-porous materials.

IPCO
INDUSTRIAL PRODUCTS COMPANY
2830 N. FOURTH STREET · PHILADELPHIA 33, PA.

D. and M. AUTOMATIC GUARDS



● This punch press guard meets the most exacting standards of safety engineers and safety laws. Permits operator to feed the press without hindrance.

Write for complete information.

D & M GUARD CO.
825 Revere Ave., N. Tonawanda, N. Y.

Power Press Guards

Protect Operators • Increase Production

Wiesman cam-action press guards enable operators to work at top speed without fear of accident. Guarding is effective and completely automatic . . . does not hamper operator's vision or movement. For all sizes and styles of presses. Used by hundreds of firms. Inexpensive . . . easy to install.

Over 30,000 sold

Write for descriptive folder and 30-day FREE trial offer.

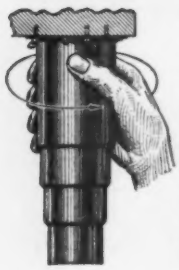
Name_____

Address_____

Title_____

Wiesman Manufacturing Co.
31 South St. Clair Street • Dayton 2, Ohio

Guide Pin Covers



PROTECT OPERATOR AND GUIDE PINS

Effectively guard against injury to operator, die and press on operations where bushings leave the guide pins. Protect pins and bushings from chips and dirt when entire pin and bushing are covered. Inexpensive, easy to attach.

Felt Oiler Ring in top units provides POSITIVE lubrication.

WRITE TODAY FOR DESCRIPTIVE FOLDER AND PRICE LIST

Name_____

Address_____

Title_____

Wiesman Manufacturing Co.
31 South St. Clair Street • Dayton 2, Ohio

should be selected by qualified engineers.

Switches

Available switches include snap switches, knife switches, enclosed externally operable air-break switches, and oil switches. Those designed for controlling individual motors and machine tools and for lighting and power circuits are of the enclosed type.

Open-knife switches are undesirable because of exposure of live parts and because of the arc formed when the switch is opened. It is advisable, therefore, to enclose knife switches in grounded metal cabinets having a control lever extending through a slot in the cover.

Oil switches have contacts which operate while submerged in oil. They are especially desirable in circuits of 750 volts or more and may be used in lower voltage circuits.

Push-button or other snap switches usually have all live parts enclosed. Flush switches should be installed in metal boxes, and surface switches used in open wiring and moulding work should be mounted on porcelain or composition sub-bases. These switches should indicate whether the circuit is open or closed.

Snap switches are preferable to key or pull-chain sockets. If key sockets must be used, porcelain, moulded composition, or other non-conductive types are recommended. Pull-chains should contain non-conductive links.

Cords, Sockets, Lamps

Extension cords should be of a type listed by Underwriters' Laboratories and labeled to show that they meet all requirements of the *National Electrical Code*. They should be inspected regularly. Kinking or excessive bending of cords should be avoided.

Ordinary lamp cord should not be used where it will be exposed to mechanical wear or to moisture—never for extension lamps in boilers, tanks, or on damp or metal floors.

Cord for portable tools and equipment is made in several grades. Rubber-sheathed cord should be used with tools and lamps in boilers, tanks and other grounded enclosures.

For heating devices, such as electric irons and water heaters, the cord has an insulating covering containing flameproofing material such as asbestos fiber. It resists high temperature but not wet conditions.

Sockets should be of porcelain, non-conducting plastic, or rubber covered. Ungrounded metal-shell sockets are not recommended.

Extension lamps are sometimes used where a shock of 110 volts might be fatal. Safe cords and lamp holders

"NO OPEN HANDLING OF INFLAMMABLE LIQUIDS" WITH

Insto-gas

TORCHES and FURNACES

THEY'RE SAFE!

NOW IS THE TIME

to check the portable heating equipment in your plant. If your torches and furnaces are not listed by Underwriters', be sure to get Insto-Gas immediately. Insto-Gas is non-explosive from concussion, chemically staple and non-toxic. Insto-Gas cylinders are I.C.C. approved, they have diaphragm type valves, positive closing spring relief valves and are equipped with excess flow safety checks. For 16 years these safety features have made Insto-Gas first choice in all kinds of plants.

MANY USES

Insto-Gas instant lighting torches and melting furnaces provide safe portable heat for all kinds of maintenance and repair work such as removing bearing metal, pre-heating, annealing, melting babbitt, thawing frozen pipes, relining vats and tanks, melting metal, paraffin, asphalt or tar, soldering copper pipe fittings and all electrical and plumbing work.

Insto-Gas is listed by both Underwriters' and Factory Mutuals' Laboratories.

Write today for literature and name of nearest distributor.

Insto-Gas Corporation • Detroit 7, Mich.

Section 4—Machine Guarding and Operation

must be provided and maintained in good condition. Handles should be of non-conducting material and there should be no metallic connection between the lamp guard and the socket shell.

Miniature Voltage. Portable transformers which step the lamp voltage down to 6 volts are frequently used where the shock hazard is serious.

Linemen's Equipment

Special tools and protective equipment have been developed for linemen and generating station employees. Operating conditions vary but certain items are standard.

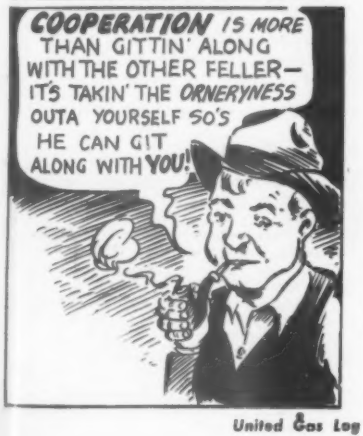
Tools used near energized equipment should be designed for the job and insulated to minimize the danger of short circuits in the equipment and shock to the operator. Insulation on tools alone, however, is not adequate protection near high voltages.

Items in common use include:

Linemen's rubber gloves
Leather protector gloves
Rubber line hose and blankets
Linemen's belts and safety straps (leather and web) See Section 2
Climbers
Rubber coats
Tool pouches
Tool buckets
Fuse pullers
Switch sticks
Insulated stools
Switchboard mats

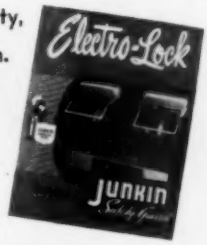
Regular, thorough inspections should be provided for all protective equipment, and any article found defective should be immediately repaired or replaced.

Brooms, brushes and other cleaning equipment used around energized equipment should be free from metal. Insulating handles of tools should be kept clean and dry and only non-conducting preservatives used on them.


TIPS FROM THE OLD TIMER
COOPERATION IS MORE THAN GITTIN' ALONG WITH THE OTHER FELLER— IT'S TAKIN' THE ORNERYNESS OUTA YOURSELF SO'S HE CAN GIT ALONG WITH YOU!
United Gas Log

WITH THIS NEW JUNKIN ELECTRO-LOCK SAFETY SHIELD

Another Junkin device that actually ENFORCES safety, because grinder can't operate until shield is in position. Write today for our new booklet which gives full details of this latest protection against the dangers of grinder operation.



JUNKIN SAFETY APPLIANCE CO., INC.
930 W. HILL ST. LOUISVILLE, KENTUCKY

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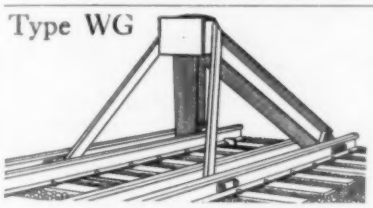

Let us help you modernize your tracks; make them efficient for every day use and safer too. Catalog free. When a bumping post is knocked out don't simply say "they hit it too hard" and let it go at that. Your investigation will lead you to use Hayes Posts, designed by engineers for engineers. Hayes has led since 1903 in safety devices for railway side tracks; Bumping Posts, Cushion Wheel Stops and Derails.

Hayes Track Appliance Co.,
122 N. 3rd St.,
Richmond, Indiana

GARDWELL Products

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Send for latest GARDWELL Catalog of complete personal protection including safety clothing and equipment.

Safety CLOTHING AND EQUIPMENT Co.
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PHONE EN 1722

Lubrication

PROTECTING machinery against friction is one of the serious problems of modern industry. Much attention has been given to the problem by machine designers and builders, lubricating system manufacturers, lubricant suppliers and lubrication engineers.

Modern machines operate at high speeds upon countless bearings, and these need proper lubrication at regular intervals.

As machinery became more complicated and operating speeds increased, old methods of lubrication became inadequate. New types of lubricants also had to be developed for high speed machinery.

The first important improvement on the oil can was the pressure gun and nipple introduced about 1918 for servicing motor vehicles. Some five years later portable systems began to be used in industry.

While a great improvement over old methods, these systems still had drawbacks. Many machines had to be shut down before lubrication.

The next step was to group fittings at central stations and run individual tubes to the bearings. The machine could be serviced from the floor without risk to the oiler but the amount of grease delivered to each bearing depended largely on guesswork.

Next came automatic pressure feeding grease cups, designed to provide a constant supply of grease to all bearings while the machine was in operation. Centralized lubrication systems have been undergoing numerous refinements to meet industry's growing needs.

Complicated machines with hundreds of remote bearings can be served efficiently and economically by centralized systems. Clean oil or grease is supplied under pressure from the central pumping unit to every bearing. The lubricant is renewed as often as the machine and the operation require, which may be once or twice per shift or several times an hour.

On some systems an indicator signals the delivery of the correct amount of oil to each bearing. Waste is avoided.

With a central pressure system there is no need to stop the machine for lubrication and the hazardous job of crawling over the machines is eliminated.

Pressure lubrication systems require the use of special greases. No single lubricant has been found best for all types of machines.

For Older Installations

On older machines an automatic system may not be practical. However, other measures will help to improve lubrication and reduce the hazard to the oiler. One or more of these methods may be used for reaching remote bearings:

1. A service platform or runway giving access to several or all of the bearings. Moving parts of machinery should not project over platforms; if this is unavoidable, these parts should be enclosed.

2. A small car suspended from an overhead I-beam. The car is large enough to accommodate the oiler and enables him to travel parallel to the line shaft, and reach bearings with his oil can or grease gun.

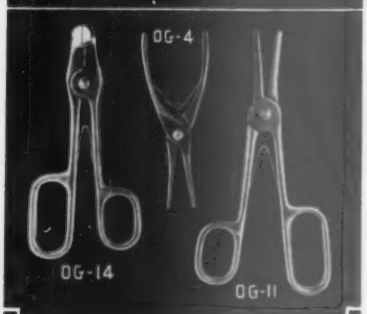
3. Long-spout gravity flow or force-feed oil cans, which enable the oiler to stand in the clear. Some of these have sufficiently long spouts to enable the oiler to oil overhead line shaft bearings from the floor.

4. Oil reservoirs placed at individual bearings with control devices operated by hand poles.

5. Extension pipes on bearings where grease or oil cups are in the danger zone. These may not be practical in cold places where low temperatures make it difficult to force oil or grease through the pipes.

With long-spouted oils cans, it is sometimes difficult to locate a small oil hole. In such cases oil cups with lids that snap open and shut are advisable. These cups keep dust out of the bearings.

SAFETY PLUS !



SAVE fingers, eyes and dies! Get Osborn Safety Pliers . . . made of Osmolloy, the sturdy, long lived aluminum alloy that will flatten under impact, leaving dies unhurt. Thousands now in use. Write for literature!

OSBORN MFG. CO.
WARSAW ★ INDIANA

THERE'S A RIGHT AND A WRONG WAY

for your men to close hopper bottom car doors with latch type locks. Provide Prescott Safety Tools—prevent serious accidents to those now using dangerous hand, foot and bar methods.

FREE!
Write for Illustrated Folder Today

THE TRUMBULL MFG. CO.
WARREN, OHIO

REFERENCES—SECTION 4

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Knives, Hand—Data Sheet D-Gen. 30.

Portable Electric Hand Tools—SPP 76.

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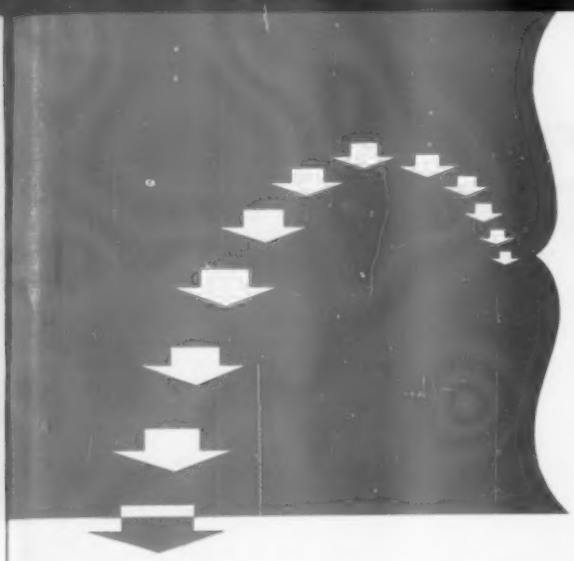

Section 5

PLANT PROTECTION

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Plant Defense Against Fire

FIRE prevention and reduction of fire losses depend on four fundamental principles:

1. Fire prevention engineering.
2. Early detection and extinguishment.
3. Limiting damage due to fire and fire extinguishment.
4. Protection of personnel from fire and panic.

Advice may be obtained from the fire insurance carrier, local fire insurance inspection bureau, municipal fire departments, National Fire Protection Association, National Board of Fire Underwriters, Underwriters' Laboratories, Associated Factory Mutual Laboratories, and other authorized agencies.

Causes. The majority of fires in industrial property can be traced to four general causes:

1. Open flames and high temperatures — Stoves, furnaces, ovens, lamps, welding and cutting, dryers, heated pipes and surfaces, matches and smoking.
2. Friction — Hot bearings, rubber belts, grinding, cutting, drilling.
3. Electricity—Defective wiring, sparks, arcs, heated resistances.
4. Chemical reactions—Spontaneous ignition, use of reagents, acids, oxidizing agents.

Conditions that may cause the start and spread of fires may be eliminated by fire-resistant construction, good housekeeping and proper storage for combustible materials. The first step in control of fire hazards is recognition that they exist. The services of a qualified fire prevention engineer will be helpful in planning for defense against fire.

Adjustable spray and straight stream nozzles (for both 2½ and 1½-inch hose) give water curtain protection for firemen and blanketing effect. They also provide solid streams for penetration.

Water spray (fog) nozzles are of value for oil fires. Water fog, owing to its low conductivity, can be used safely on electrical fires. High pressure water fog has even greater absorption. Its effective range is limited to a few feet but this can be offset to some extent by using applicator pipes of varying lengths.

Foam-generating equipment is desirable where large quantities of oil, gasoline and other flammable liquids are stored. In the larger plants, permanent generating equipment should be installed.

Liquid foam with portable equipment is valuable for extinguishing fires in smaller quantities of flammable liquids. It can be brought into action quickly.

Private fire brigades. For risks that may exceed the capacity of hand extinguishers and automatic sprinklers, the company fire brigade offers valuable additional protection. It should consist of a well trained and disciplined group of employees provided with the necessary apparatus for the exposure. It can often bring a fire under control in the brief period between its discovery and the arrival of the municipal fire department.

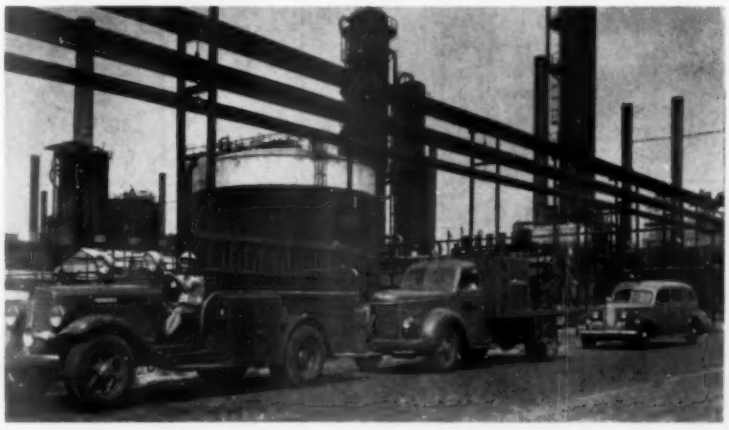
Training men for a fire brigade helps to arouse increased interest in maintaining a fire-safe plant.

Watch service. Watchmen are vital to the protection of industrial property. They discover and correct fire hazards, discover outbreak of fire or water damage in early stages, extinguish incipient fires and call help promptly when needed.

The watchman should be familiar with all parts of the fire-protective system, such as sprinkler systems, valves, drains and fire pumps. He should know how to operate extinguishers.

Recorded hourly watchmen's rounds are recommended for most plants. Approved watch-clock or supervisory systems give a record of his call at each station.

—*To page 164*



Extensive fire-fighting equipment is located at oil refineries and fire drills are held regularly. Above are the fire trucks and ambulance at Wood River Refinery of Shell Oil Company.

First Aid Extinguishers

FIRST line of defense in any fire protection plan involves portable fire extinguishers, even in plants with the most elaborate automatic systems for detection and extinguishment. Portable units can be brought into action in the vital minutes before company or city fire brigades can reach the blaze.

Fires have even been extinguished with hand extinguishers before the automatic sprinklers had a chance to function, with consequent prevention of both fire and water damage.

Effectiveness of extinguishers depends on:

1. Selection of the right type for the risk. The wrong type may actually spread a fire, or create other hazards.

2. Correct location of extinguishers. If the employee has to go too far to reach one, or if access is blocked, precious minutes may be lost.

3. Regular inspection and maintenance. Apparatus is subject to deterioration and misuse.

4. Training of employees. The best extinguisher is useless in the hands of a person who hasn't been trained in emergency procedure.

Types. Common types of first-aid extinguishers are:

1. Soda-acid
2. Vaporizing liquid
3. Carbon dioxide
4. Foam
5. Dry chemical
6. Gas cartridge
7. Hand pump

See accompanying chart for uses and characteristics.

Some extinguishers are available in both hand and wheel types. The wheeled type is highly mobile and the extra extinguishing capacity is often worth the extra cost.

The hand pump tank extinguisher came into extensive use during the war. Water, either plain or with an anti-freeze charge, is the extinguishing agent.

Some types have nozzles which throw either a pressure stream or a fine spray as needed. These extinguishers are made in 2½ and 5 gallon sizes for homes and medium sized plants where risks are not extreme.

Approval. Approved extinguishers carry the label of Underwriters' Laboratories and/or Factory Mutual Laboratories. Such extinguishers bear an instruction plate giving directions for inspecting and recharging, also the type of fire (Class A, B or C) for which the equipment is recommended and a number showing the number of extinguishers required to give one "unit" of protection.

Only approved extinguishers should be purchased. One essential is adequate capacity. A vaporizing liquid extinguisher must contain not less than one quart of the extinguishing agent to meet recognized standards.

War Surplus extinguishers bearing EAS label are still in use. This means that the extinguisher was built to Emergency Alternate Specifications developed during the wartime shortage of standard appliances. These units are efficient when in good condition but do not resist corrosion or last as long as standard approved types. They should be replaced as soon as possible.

The carbon dioxide and vaporizing liquid types should be hung on hangers supplied by the manufacturer; others may be hung on hangers or set on brackets or shelves.

Wheeled extinguishers, where required, should be accessible. Adjacent doorways and aisles must be kept clear to afford ready passage.

Placement. An extinguisher may be useless if an employee must spend valuable minutes looking for it, or if it is blocked by piles of materials.

Here are six recommended rules.

1. Locate extinguishers close to likely fire hazards but not so close that they will be in the fire zone should fire occur.

2. Place extinguishers so access to them will not be blocked by fire.

3. Install enough extinguishers to deal with the severity of the blaze which may be expected, the rapidity with which it might spread, intensity of heat, etc.

4. Mark locations conspicuously.

5. Identify each unit for the type of fire it is designed to combat.

6. Protect extinguishers from traffic.

Most extinguishers should be placed so that their tops are not more than 5 feet above the floor. These include carbon dioxide units with capacities of 10 pounds and less; water under 5 gallons; vaporizing liquid under 2 gallons; gas cartridge, foam, soda-acid, dry compounds, and water and sand pails.

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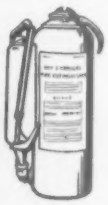
TYPES OF FIRE EXTINGUISHERS

CLASS A FIRES • WOOD PAPER TEXTILES, ETC.	FOAM OR SODA-ACID	WATER PUMP	GAS CARTRIDGE	OTHER TYPES MAY HELP ON SMALL CLASS A FIRES
CLASS B FIRES • OILS GREASES PAINTS	FOAM	VAPORIZING LIQUID	CARBON DIOXIDE	 DRY CHEMICAL
CLASS C FIRES • LIVE ELECTRICAL EQUIPMENT	VAPORIZING LIQUID	CARBON DIOXIDE	DRY CHEMICAL	USE THE RIGHT TYPE FOR EVERY FIRE

Automatic Protection

PLANT PROTECTION has no "after hours"; it is a 'round-the-clock job. In fact, the opportunities for loss are greatly increased when the plant is idle.

Most fires occurring while the plant is in operation are process fires. With trained employees and adequate extinguishing equipment on hand, these blazes are usually discovered and extinguished promptly. When the plant is idle, safety of property depends on the plant protection force supported by automatic systems.

Protection of life and property is made more effective by:

1. Automatic fire detection and alarm systems.
2. Automatic sprinkler and chemical extinguishing systems.
3. Protective lighting for buildings and yards.
4. Stout fences which keep out unauthorized persons and make patroling the property easier and safer.

Signal Systems

Electric signal systems detect fires and give alarms, supervise condition of sprinkler systems and water supplies, give water-flow alarms, and supervise watchmen's service.

Systems are divided into three main groups:

1. **Central station system.** Signals are transmitted to an independent central station where they are recorded and proper action for the emergency taken. The central station may serve several companies.

2. **Proprietary system.** Similar to a central station but controlled and operated by the owner of the protected property.

3. **Local system.** Owned and operated by the protected company but does not have an operator constantly on duty at a central station.

Detectors and Alarms

Fire alarm systems employ either automatic fire detecting devices or manually operated fire alarm boxes, or both. Types of approved equipmen are listed by Underwriters' Laboratories and Factory Mutual Laboratories.

One type of automatic system employs thermostats. These operate either at fixed temperatures or on a sudden rise in temperature known as the "rate of rise" principle.

Another system employs a loop of fine copper tubing installed on the ceiling. Air in the tubing expands when heated. This closes contacts in the signalling device and sends the alarm signal over the circuit to the central station.

Electronic devices are also used for detection of fire and unauthorized entrance. Such devices have been installed on ships where air samples from the cargo holds are drawn through a cabinet past an electric eye or gas analyzer which detects smoke instantly and sounds an alarm. Industrial smoke detectors, similar to the marine type, are now available.

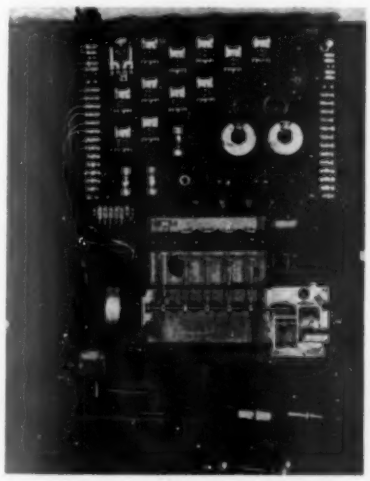
In places where fires might start slowly and smoulder for some time, photo-electric smoke detection equipment often detects smoke before heat-actuated devices are affected.

Sprinkler supervisory and water-flow alarm systems detect:

1. Open or closed position of control valves.
2. Flow of water in sprinkler systems, indicating fire or leakage.
3. Water levels and temperatures in gravity and pressure tanks.
4. Air pressure in dry-pipe systems and pressure tanks.
5. Fire pump steam pressure.
6. Voltage of supply for electric fire pumps.

Watchmen's supervisory systems transmit and record signals made at watchmen's key stations. This system is frequently combined with fire alarm systems. A plant guard's failure to check in at any station along his route is promptly recorded at the control desk or panel.

Such supervision has checked many incipient fires, prevented many robberies and brought aid to watchmen rendered helpless by accident or sudden illness. It has also prevented much water damage by sprinklers.



Control cabinet of smoke detector contains exhaust fan, sampling valve mechanism with motor drive, and supervisional electric circuits. Numbered revolving wheel at end of valve drive rod is visible through front panel when closed. It shows zone being sampled. *(Walter Kidde & Co.)*

WATCHMEN

Keep flashlight or lantern in good condition.

Use stairs, ladders and elevators carefully.

Know how to reach hospital, doctor, fire and police in a hurry.

Be able to give yourself first aid.

Avoid tripping hazards, holes and nails in floors.

Watch the plant for:

1. Bad housekeeping, particularly oily rags and flammable stuff.
2. Materials piled near sprinkler heads and fire equipment. Fire doors blocked or left open.
3. Signs of smoking in dangerous places.
4. Leaks of flammable liquids or gases.
5. Open flames, gas or electric heaters operating improperly or out of order.
6. Fire fighting equipment out of place or out of order.

SAFETY INSTRUCTION CARD No. 35
National Safety Council PRINTED IN U.S.A.

Automatic Sprinklers

There are about 250,000,000 sprinkler heads now in service in American buildings ready to go into action instantly in case of fire. Records of the National Fire Protection Association show that of 71,519 fires in sprinklered properties during the past 47 years, 96 per cent were extinguished or held in check by sprinklers.

The sprinkler head contains a fusible plug which melts and releases the water when a predetermined temperature is reached. Valves control distribution of water to all parts of the system. Various types of heads are available for use under a wide range of temperature conditions.

Sprinkler systems include devices to give automatic alarms when the sprinklers operate.

Wet pipe systems are used where there is no danger of pipes freezing. Water is maintained under pressure right up to the sprinkler heads and operation is immediate.

Dry pipe systems are used where there is danger of pipes freezing. Air under pressure instead of water, is maintained in the pipes. Opening of a sprinkler head releases the air pressure, resulting in the operation of a valve admitting water to the system. There is a slight delay between the opening of the sprinkler head and the discharge of water.

After a fire, sprinkler heads should be replaced promptly.

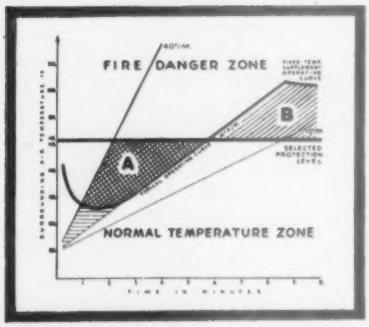
Causes of failure. In the few cases where sprinklers have failed to operate effectively in case of fire, the fault has rarely been due to the sprinkler mechanism. Reasons include deficient water supply, freezing, defective dry pipe valves, foreign material

—*To page 226*

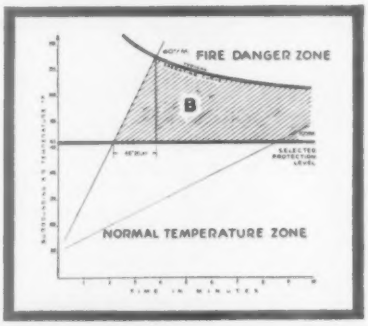
Charts show how only DETECT-A-FIRE signals instantly!

No false alarms!
No unprotected zone!
No thermal lag!

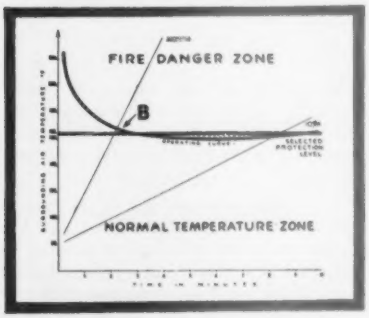
Approved by Factory Mutual Laboratories, Listed by Underwriters' Laboratories, Inc., for Ordinary and Hazardous Locations Class I, Group D; Class II, Groups E, F and G.



RATE-OF-RISE DETECTOR has serious false alarm zone (a) dangerous unprotected zone (b) even with fixed-temperature supplement.



FIXED-TEMPERATURE DETECTOR permits wide unprotected zone (b) due to thermal lag.



DETECT-A-FIRE makes unprotected zone negligible (b) does away with false alarms.

Fenwal

DETECT-A-FIRE

Combines Fixed-Temperature Response with Rate-Of-Rise Compensation for Instant Alarm

SENSITIVE...
but only to heat

FREE bulletin gives you complete details on amazing Detect-A-Fire. See how you, too, can improve your fire alarm and extinguishing systems. Just mail coupon.

NAME.....POSITION.....
COMPANY.....
STREET.....
CITY.....ZONE.....STATE.....

FENWAL INCORPORATED, 59 Pleasant Street, Ashland, Massachusetts
Temperature Control Engineers

Cleaning Up Fire Hazards

KEEPING a plant clean and orderly is a basic fire prevention measure. Accumulations of combustible waste provide fuel for fire whenever there is a source of ignition present. Some materials heat and ignite spontaneously.

Housekeeping goes far beyond surface neatness. It includes safe storage arrangements, exhaust ventilation for removal of dusts, gases and vapors, avoiding dripping of flammable liquids and accumulation of combustible residues, and similar measures.

It also means easy access to all parts of the plant, both for normal traffic and for the emergencies of fire fighting.

Waste disposal. Fire breeding conditions can be avoided by regular removal of waste and rubbish. The most dangerous accumulations are out of sight—in out of the way corners, under stairways, and in machine and elevator pits.

Dusts, such as lint, flour, starch, etc., should not be allowed to accumulate on machines, walls, beams and fixtures. All organic dusts and many metallic dusts are explosive when suspended in air in the right proportions.

Combustible residues in spray booths, exhaust ducts and under hoods create serious hazards.

Excelsior, shavings, saw dust and paper trimmings should not be allowed to accumulate.

Approved covered metal cans in which waste can be deposited are needed if rubbish is to be kept off the floor. Cans should be emptied daily and the contents hauled away or burned in a safe incinerator.

Spontaneous ignition. Oils, paints, varnishes and lacquers, with their thinners and solvents, and other flammable liquids require special care because of the risk of spontaneous ignition when they are absorbed in rags, waste, burlap and clothing. Animal and vegetable oils, especially drying oils used in paints, are particularly hazardous.

Cleaning Schedules. Keeping the plant free from these hazards requires a schedule of regular and frequent cleaning. Enough men should be assigned so that cleaning will keep up with dirt-producing operations.

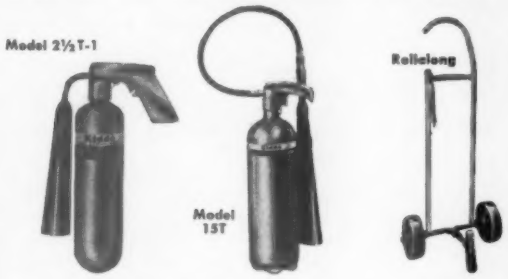
Ventilation. Processes producing combustible dusts, oil spray, heavy fumes, or spray residues require adequate exhaust and collection systems.

Storage. A good rule is to limit supplies of all combustible materials in any building.

Where quantities of oil, gasoline and other flammable products are not large enough to require large storage tanks, an oil house for storage of these materials in barrels, drums or

Kidde FIRE-EXTINGUISHING EQUIPMENT

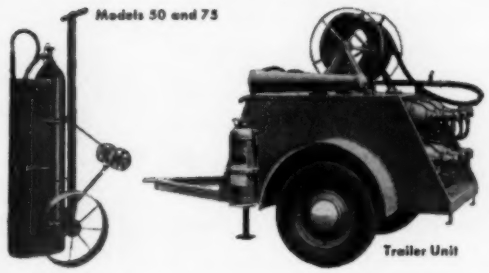
Carbon Dioxide (CO_2) Hand Portables



*Kidde** Hand Portables offer an effective means of fighting incipient fires in flammable liquids and electrical equipment. Carbon dioxide (CO_2) capacities range from 2½ to 25 pounds. All sizes are equipped with easy-to-operate Trigger-Finger Control.

The Rollalong offers a simple method of transporting the larger sizes of extinguishers with a minimum of effort.

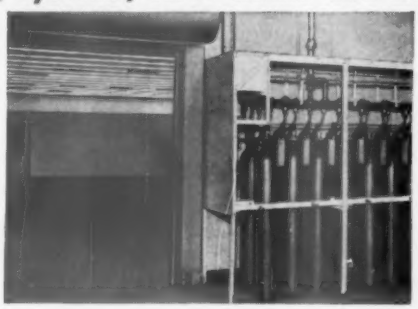
CO_2 Mobile Equipment



Kidde Mobile Equipment provides the punch for fighting fires too big for Hand Portables to extinguish. Wheeled units are available in 50- and 75-lb. capacities in 1-cylinder types; 100-lb. capacity in 2-cylinder type.

A typical Trailer Unit carries 300 pounds of CO_2, with 100 feet of hose, in addition to CO_2 Portables and a choice of water, foam or dry chemical types.

CO_2 Systems, Hose Racks and Reels



Kidde Built-in Systems are individually engineered for the protection of fixed-position hazards. Operation may be manual or automatic. Several hazards can often be protected from a single bank of cylinders.

Kidde Hose Racks and Reels permit fighting of fires anywhere within a wide radius of the fixed position of the rack or reel.

Dry Chemical Extinguishers

Kidde Dry Chemical Extinguishers are particularly effective against outdoor fires in flammable liquids and electrical equipment. Like *Kidde* CO_2 Portables, they are equipped with Trigger-Finger Control. Design prevents packing of the dry chemical. Horn construction gives improved powder dispersion pattern. Made in capacities of 20 and 30 pounds.

*Also known as "LUX"

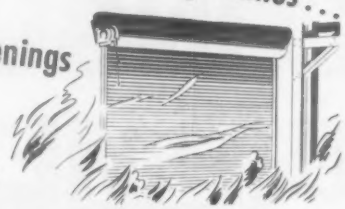
The words "Kidde" and "Lux" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

Kidde

Walter Kidde & Company, Inc. · 345 Main Street, Belleville 9, N. J.

Kinnear Rolling Fire Doors

Famous "Akbar" Doors cut off drafts... defy flames... block spread of fire at all openings



PROOF! After long exposure to blistering heat and flame in a disastrous, major fire, the Kinnear Rolling Fire Door at right remains intact. It completely blocked damaging fire from spreading through the opening to the building area on the opposite side of the wall.

These fireproof all-steel doors do a *thorough* job of blocking off flame spreading drafts.

YOU'RE SAFER with the *automatic* fire protection of "Akbar" Rolling Fire Doors! Fireproof all-steel doors are out of the way, overhead, when not in use. But when fire threatens, they promptly seal off doorways, windows and corridors.

Positive enclosure is certain because the doors are *pushed* downward automatically, by strong auxiliary springs. A special safety device controls their downward speed, guarding against personal injury and reducing impact force on the floor.

For emergency exit, the doors can be raised after automatic closure. They will then close again, quickly and automatically.

Tested and labeled by Underwriters' Laboratories Inc., Akbar Fire Doors often save enough in reducing insurance rates to pay for themselves in two or three years. Built to fit doorways, windows and other openings of any size, they can be equipped to fit regular, daily service use, with or without motor operation. For service use only, standard "non-labeled" Kinnear Rolling Doors are preferred. Write for details.

Saving Ways in Doorways

KINNEAR ROLLING DOORS

The KINNEAR Manufacturing Co.

Factories: 1720-40 Fields Ave., Columbus 16, O.
1742 Yosemite Ave., San Francisco 24, California

Offices and Agents in Principal Cities

other suitable containers is recommended.

The oil house should be located some distance from other buildings so the plant will not be endangered should fire break out.

Floors should be non-combustible; concrete is frequently used. Electric lighting fixtures should have vapor-proof globes.

All local codes and regulations for storage of flammable materials should be followed.

Smoking. Many plants have removed restrictions on smoking while at work in non-hazardous areas. Where the hazard exists, certain areas have been set aside for smoking and the no-smoking rule rigidly enforced elsewhere. Safe containers for matches and butts should be provided.

Congestion helps the spread of fire and hampers fire fighting. Equipment should be well arranged, stock piled neatly and securely, and ample aisle space provided.

Stock piles should not be high enough to interfere with operation of sprinkler heads and stock or equipment should not block fire extinguishers, sprinkler valves, or fire doors.

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Dust Explosions—Safe Practices Pamphlet 104.
Fire Brigades—SPP 36.
Fire Exits, Drills and Alarms—SPP 19.
Fire Causes and Prevention—SPP 31.
Fire Extinguishment—SPP 24.
Fire Retardant Treatment for Fabrics—Data Sheet D-T 2.
Fire Retardant Treatment for Wood—Data Sheet D-Gen. 20.
Industrial Explosion Hazards—SPP 34.
Salamanders—Data Sheet D-Con. 4.
Static Electricity—SPP 52.

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Extinguishers When You Need Them, by Norman H. Davis—June 1949, p. 22.
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They Play with Fire (Underwriters' Laboratories)—Sept. 1949, p. 18.

Forest Products Laboratory:

Fire Retardant Coatings—Bulletin R-1280.

National Board of Fire Underwriters

Building Code
Carbon Dioxide Fire Extinguishing Systems and Inert Gas for Fire and Explosion Prevention.
Central Station Protective Signalling Systems.
Construction and Installation of Tanks.
Hose Houses for Mill Yards.
National Electrical Code.
Proprietary and Local Systems for Watchman, Fire Alarm and Supervisory Service.
Suggestions for Organization, Drilling and Equipment of Private Fire Brigades.

National Fire Protection Assn.:

Building Exits Code.
Handbook of Fire Protection — Crosby-Fiske-Forster.
National Fire Code for Building Construction and Equipment.
National Fire Code for Prevention of Dust Explosions.
National Fire Code for Extinguishing and Alarm Equipment.
Employee Organizations for Fire Safety.
Protection of Life and Property Against Lightning.

Demand JUSTRITE Safety Approved Products

SAFETY FILLING CANS. Flexible metal pouring hose. 3 or 5 gallons.

SAFETY CANS. Seven sizes. One pint to 1 gallon with trigger handle, larger sizes with swing handle (shown). Labeled by Underwriters'.

Model 1610 EXTINGUISHER Entirely new development in carbon tetrachloride extinguishers. Labeled by Underwriters'. Air pressure operated. Easily refilled.

OILY WASTE CANS Heavy gauge galvanized for safe handling of waste, rags and other flammable materials. Underwriters' labeled. Sizes, 6 to 25 gal.

NO. 1904-S HEADLIGHT. Adjustable elastic headband. Case easily slipped in pocket holds 4 standard flashlight cells.

NO. 1717-S FLASHLIGHT. Compact 3-cell design. Plastic case, metal reinforced, guaranteed. No. 1728-S FLASHLIGHT with 24" flexible extension.

NO. 2101-S FLASHLIGHT. Eight standard flashlight batteries give 12-volt power. Or 6-volt lantern battery may be used for economy.

NO. 2144-S LANTERN. All purpose. Two bulbs for either spot or spread beam. Adjustable bail and stand. Uses 6-volt battery.

NO. 2175-S FLASHING. Up to 67 hours continuous flashing service. Red Fresnel glass globe. For 6-volt battery.

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JUSTRITE SAFETY PRODUCTS

Available through leading industrial supply distributors everywhere.

JUSTRITE MANUFACTURING COMPANY
2061 No. Southport Ave., Chicago 14, Ill.

Explosion Hazards

EXPLOSIONS are the most spectacular and disastrous of accidents. They generally occur without warning. Fire, on the other hand, is progressive and usually gives some chance for escape.

Dust explosions at the operation are sometimes followed by secondary explosions when accumulations of dust are jarred into the air by the initial explosion.

Some substances, such as dynamite and gunpowder, contain the oxygen necessary for rapid combustion. These are manufactured, stored, transported and used under strict regulations and the record for commercial explosives has been good.

Much more dangerous than the recognized explosives are the gases, vapors and dusts encountered in many industrial processes. When mixed with the right proportion of air, they form explosive mixtures.

The explosive force of a vapor-air or dust-air mixture is in proportion to the degree of confinement. Many a substance which may burn harmless in the open develops explosive force if combustion occurs in a confined space.

All organic and some metallic dusts are combustible. Some substances which cannot be ignited in their normal state can be exploded when finely divided when mixed with the right proportion of air.

The following lists give some of the more common substances whose storage and use involves explosion hazards:

Gases:

Gases are listed here alphabetically, not in order of hazard.

Acetylene, carbon monoxide, ethylene, hydrogen, illuminating gas, liquefied petroleum gas, natural gas, miscellaneous commercial gases.

Liquids:

Class 1—Liquids in this class have a flash point below 25° F., closed cup tester.

Ether, Carbon disulphide, Gasoline, Naphtha, Benzol, Collodion, Liquefied petroleum gas, Acetone.

Class 2—Liquids in this class have a flash point above 25° F., and below 70° F., closed cup tester.

Alcohol, Amyl acetate, Toluol, Ethyl acetate, Methyl acetate.

Class 3—Liquids in this class have a flash point above 70° F., and below 200° F., closed cup tester.

Kerosene, Amyl alcohol, Turpentine, Fuel oil.

Other flammable liquids in the following list should be included in the above classifications according to their flash points:

Paints, varnishes, polishing solutions, dryers, cleaning solutions, illuminating oils, miscellaneous petroleum products.

Safety Cans

Safety cans with self-closing spouts are desirable for any liquid that will burn and mandatory for those in Class 1.

Red is the prescribed color for containers, which should be plainly marked to identify the contents.

Safety cans of more than one gallon capacity, where used for solvents or thinners, should have a flash-arresting screen at the spout and fill connections. These screens prevent external flame from igniting vapors in the can when the liquid is being poured.

Flash-arresting screens are also used in vent pipes, storage tanks and drums from which flammable liquids are dispensed.

Flameproof Fabrics

In some cities and states, textile fabrics used in places of public assembly must be flameproofed. The flameproofing process also increases resistance to weather and mildew.

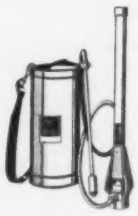
Textiles may be purchased already treated or customers may send their own fabrics to the mills for flameproofing.

Flameproofing materials are available in proprietary compounds or under their chemical names. Ingredients include ammonium sulphate or phosphate, ammonium chloride, borax and boric acid. They are usually applied to the fabric in saturated solution.

VAPORIZING LIQUID
The all-purpose extinguishers effective on almost every kind of fire. Safe on electrical fires, too! Hand or pressure operation.

CHEMICAL FOAM
2½ gal. size produces about 22 gals. of fast-acting foam. Ideal for flammable liquid hazards. Also 10 gal. and 40 gal. (above) wheeled units, and systems.

CARTRIDGE-OPERATED
Eliminates annual recharging. For fires in wood, paper, textiles. Shoots water or anti-freeze solution. 2½ gal. size.



AIR FOAM
Couple Playpipe to hose line. Every 19 gals. of water and 1 gal. of PYRENE Foam Compound yield 350 gals. of foam! For ordinary combustibles and flammable liquids.

SODA-ACID
Standard protection for ordinary combustibles. Shoots a steady 40 ft. stream. 2½ gal. size. For offices, factories, stores. Also 40 gal. wheeled units.

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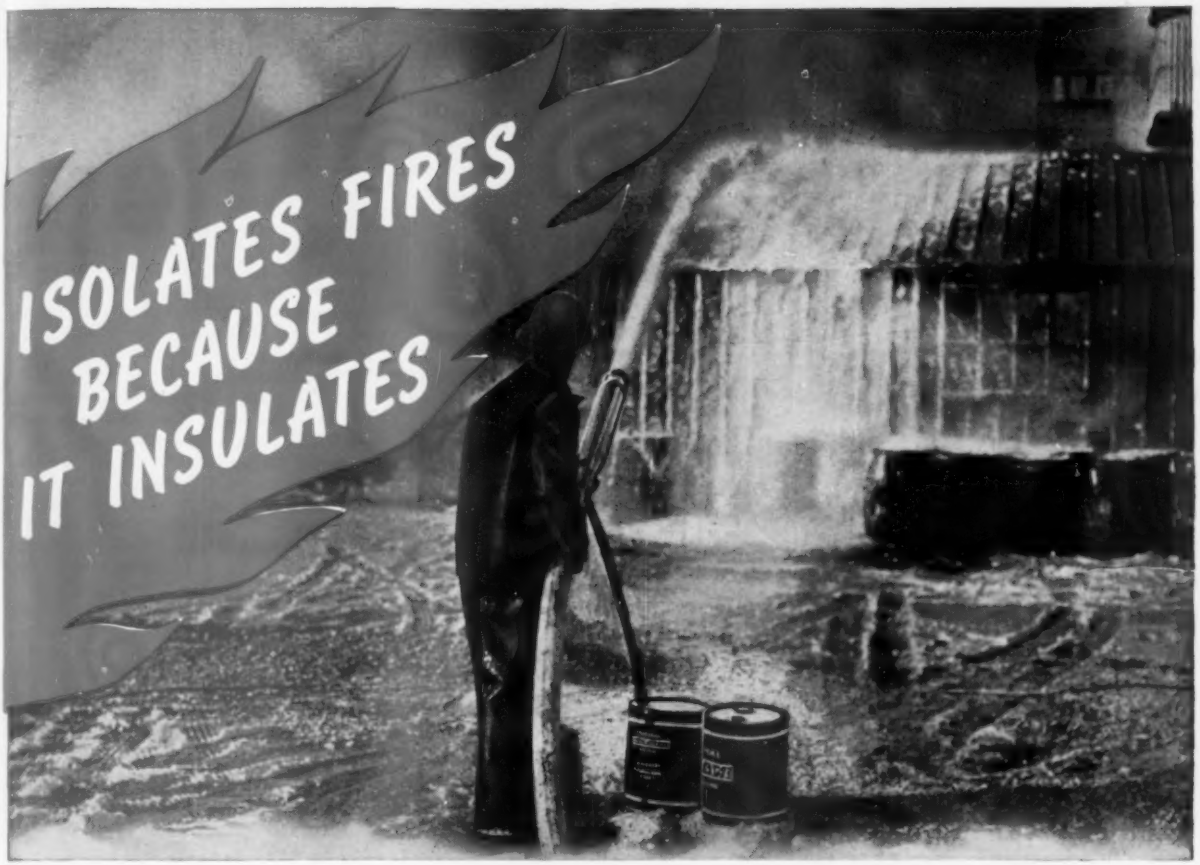

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National AER-O-FOAM makes it possible and very practical to stop the spread of fires and to insulate buildings from heat and flames. With a can of AER-O-FOAM and the AER-O-FOAM NOZZLE, any hose line becomes a bulwark against fire.

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Plant Defense

(From page 155)

In many plants, fire protection is one of the responsibilities of the safety department. Even in larger plants where there is a division of duties the safety department has an important part in all activities involving protection of life and property.

Types of Fires. Fires have been classified by underwriters and manufacturers in three main groups.

Class A. Fires in ordinary combustible materials, such as wood, paper, textiles, and rubbish. They require quenching or cooling effects of water or solutions containing large proportions of water.

Class B. Fires in flammable liquids, such as gasoline, solvents, oil, grease, paint, varnish and lacquers, where blanketing or smothering effect is essential.

Class C. Fires in electric equipment, such as motors, generators, and switch panels. These require a nonconductive extinguishing agent.

Fires in motor vehicles, aircraft and motorboats have the same problems of extinguishment as Class B but equipment must be portable. Extinguishing agents must be nonfreezing.

There are many types of apparatus designed for a variety of risks, but all extinguishers are based on one of two fundamental methods of quenching fires: (1) Bringing the temperature of burning material below the kindling point; (2) Depriving burning material of oxygen which supports combustion.

Planning Protection

The first step in a fire protection program is to make a survey of the individual plant, its layout, manufacturing processes, materials handled, storage methods, and fire protection equipment. With this information, plans can be made for improving structure and layout where practicable, installing additional or different equipment where necessary, and training employees in methods of prevention and extinguishment.

In all plans, the municipal fire department should have a prominent place. The local department should be familiar with the plant and its problems and it can often give helpful suggestions on training and equipping plant brigades.

For the protection of the plant and surrounding property the city fire department is an important line of defense but the company should develop its own defenses. It takes time for outside apparatus to reach a fire and those few minutes are often vital.

First-aid extinguishers operated by employees, automatic sprinklers, and plant fire brigades extinguish most industrial fires without outside help. However, a thorough plan of protection does not depend entirely on any one agency.

Automatic sprinklers provide important protection for many types of occupancy but trained employees with hand extinguishers are also needed. Employees often put out small fires in sprinklered areas before the sprinkler heads open, thus minimizing water damage.

Water Supplies. Water is the most widely used and effective extinguishing medium for most types of fires—important exceptions being those with electrical equipment, flammable liquids, and in materials where water damage would be excessive.

In determining supply requirements, structural conditions and processes must be considered and the number of fire streams that might be required to cope with a blaze.

Pumping equipment in connection with plant water supply systems should be sufficient to supply the number of streams required at adequate pressure. Allowance should be made for pumps being out of service for repairs and for continuity of pumping in event of power failure.

Hydrants should be located throughout the plant area so as to give adequate coverage of all buildings, and preferably not less than 50 feet from any building.

Systematic maintenance is essential. When hydrants are installed, attention should be given to drainage

—To page 225

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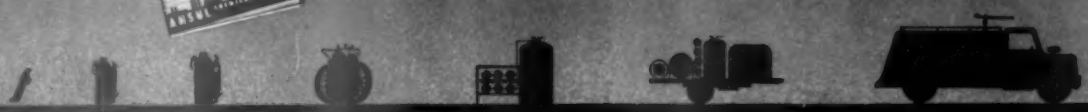

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Section 5—Plant Protection

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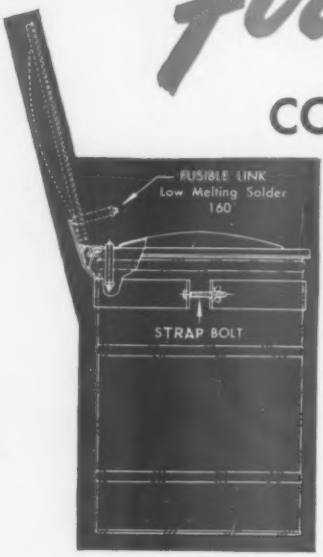


SPECIFICATIONS

The Protectoseal Self-Closing Drum Cover is constructed of heavy gauge steel, and is available in two sizes:

Cat. No. 4830 for 30 gal. drum
Cat. No. 4955 for 55 gal. drum

A fusible link closing device is set inside the cover near the hinge. At 160° F. the solder melts, releasing the plunger spring which closes the lid instantly. Should the fusible link be destroyed by fire, *Protectoseal* Special Solder replacements are easily screwed in position to reset plunger.

WITH ONE SPIN OF A WING NUT,

any inexperienced employee can convert a used steel drum into a valuable piece of fire-prevention equipment. No special tools are necessary. Fit the collar of the *Protectoseal* Self-Closing Drum Cover over the top of an empty 30 or 55 gallon drum and tighten the bolt. This simple operation makes a large capacity fire-safe waste container for combustible materials.

FUSIBLE LINK CLOSES COVER AUTOMATICALLY . . . SMOTHERS FIRE

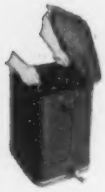
If temperature within drum reaches 160°, the fusible link in the *Protectoseal* Drum Cover melts, releasing spring-loaded plunger. This action closes cover instantly snuffing out fire within drum or protecting contents of drum from outside sources of ignition.

Protectoseal No. 883 Laboratory Bench Can

One-gallon oval shape can made to economize space on laboratory shelf. All the fire prevention features of a regular safety can including a double cylinder, perforated fire baffle. No channel around top of can to permit solvent or dust to collect. Smooth back surface for stenciling on names of solvents. Pistol grip—easy to grasp and pour out of can.

Protectoseal Fire Extinguishers

Underwriters Laboratories Approved for Class A-1 fires. No. 280 2½-gallon and No. 281 5-gallon capacities. Constructed of heavy gauge lead coated steel with electrically seam-welded seams. Interior corrosion resistant-coated with two applications of asphalt base paint. Double action pump maintains steady pressure and stream of 30 feet minimum at normal pumping speeds.



Protectoseal No. 750 Air-Matic Parts Washer

AIR POWERED (not air agitated) washing tank operates on any compressed air supply. In case of fire the 160° fusible link melts, drops lid and snuffs out fire. Parts to be cleaned move *through* the solvent instead of *with* it and thus minimizes turbulence and vapor losses. 6½ gallon capacity designed for use with mineral spirits.

Protectoseal No. 208 Tilt Can

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Protectoseal Supply Can

Protectoseal Plunger Can

Protectoseal Oily Waste Can

Protectoseal Bench Can

Protectoseal Safety Can

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THE PROTECTOSEAL CO.

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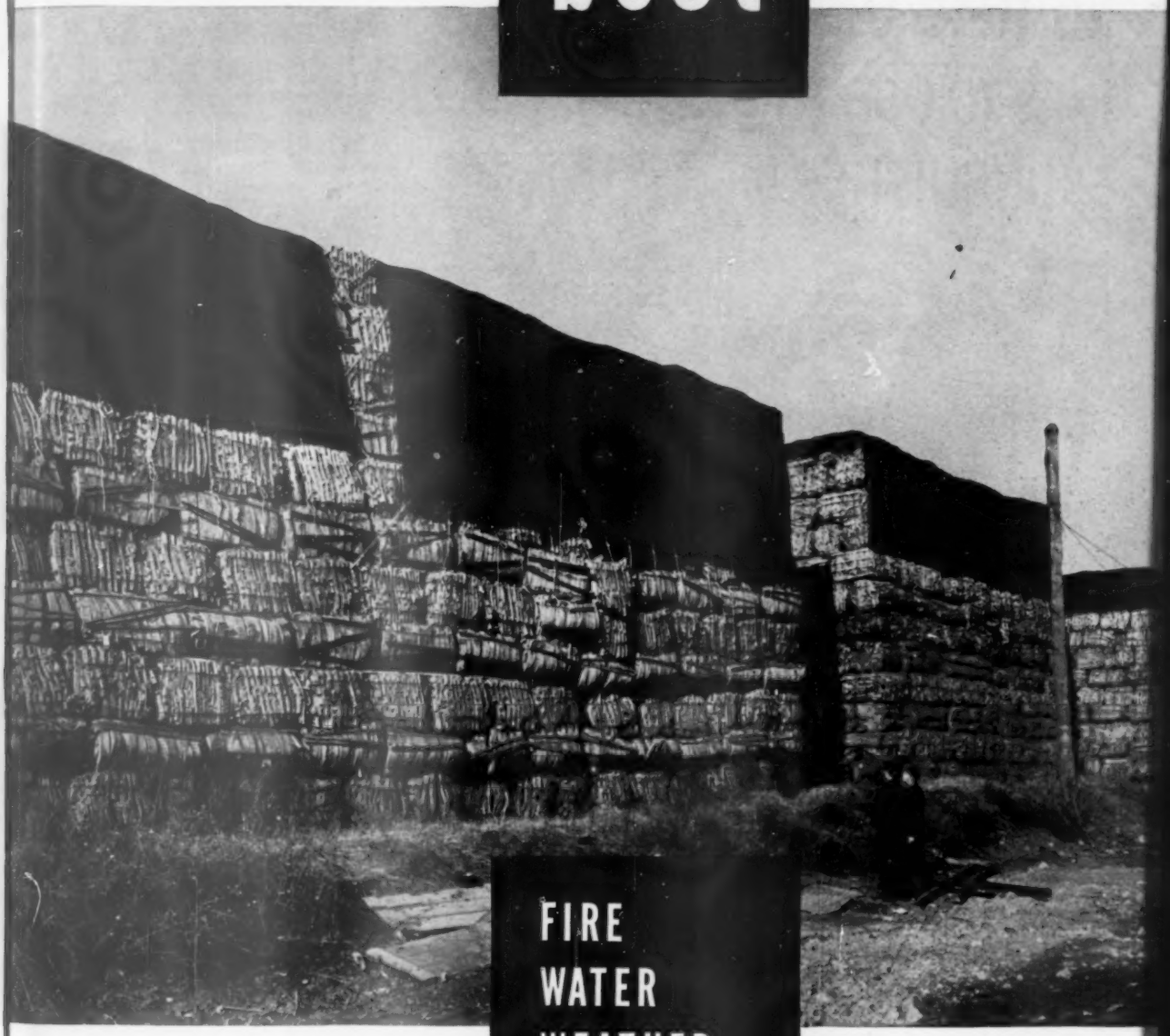

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Learn how Randolph gives your plant better *preventive* fire protection! Write Randolph Laboratories, Inc., 2 East Kinzie St., Chicago, 11, Illinois.

Randolph
FIRE PROTECTION EQUIPMENT

Extinguishers

(From page 156)

The 15- and 20-pound carbon dioxide, 5-gallon water, 5-gallon foam, and 2- and 3-gallon vaporizing liquid types should have their tops not more than 3½ feet above the floor.

Marking Locations. To make the extinguisher conspicuous in the midst of the excitement caused by the outbreak of fire, a contrasting background should be provided.

One method is to paint a large red spot on the floor of the aisle and under the location of the extinguisher to act as a continual reminder.

Another method is to paint a vertical red band with yellow borders down a side wall or column where the equipment is placed. The stripes should be high enough to be visible from almost any location in the room, taking into consideration height of stock piles, machinery, etc.

Another means of attracting attention is painting a large red or white background on the wall behind the extinguisher.

Arrows pointing to locations and "For Fire" signs are also helpful.

These locations may also be marked with lights of distinctive color, which do not conflict with emergency exit lamps.

Where extinguishers are located in cabinets heated with an electric bulb to prevent freezing, a window can be placed in the cabinet so the light will spot the location.

Care of Equipment. The following rules will prolong the usefulness of equipment:

1. Recharge extinguishers immediately after use and after the interval of time recommended by the manufacturer.
2. Use only recharging supplies and replacement parts obtained from the manufacturer.
3. Follow instructions on the unit closely when recharging.
4. Inspect extinguishers at least once a month to make certain they are filled, operative, and have not been tampered with.
5. If an extinguisher is damaged by a blow or fall so that there is a possibility that the shell or seam has been damaged, have the extinguisher tested by the manufacturer or his agent.
6. Do not attempt repairs of damaged extinguishers. Return them to the manufacturer.
7. Have men on the premises who are familiar with the inspection and recharging of extinguishers.

Recharging. Use of commercial carbon tetrachloride for vaporizing liquid extinguishers generally results in deterioration of the shell and interior mechanism. Commercial grades contain water which reacts slowly

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MEDICAL AND HEALTH SERVICE

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The Medical Department

THE physician and the safety director share the responsibility for the protection of the worker against the risks of injury and occupational diseases.

Care of the injured was the first responsibility of the plant medical department. It still ranks first in most companies. But the functions of industrial medicine have been steadily expanding.

As part of the broader safety organization, the medical department conserves industry's human resources through supervision of plant processes, proper placement through preemployment examinations, and continued supervision of the employee through periodic check-ups.

Introduction of new processes and new materials with actual or potential health hazards has brought added problems to the medical department. Some large corporations maintain industrial hygiene laboratories to study and control health hazards. Smaller companies obtain help from insurance carriers, state departments and private consultants.

Objectives

Basic objectives of industrial medicine as summarized by the American College of Surgeons and the American Medical Association are:

1. To ascertain by examination the physical and mental fitness of employees for work.
2. To maintain and improve the health and efficiency of those already employed.
3. To educate the worker in accident prevention and personal hygiene.
4. To reduce lost time and absenteeism from illness or injury.

Industrial medical service requires a definitely organized plan, approved and supported by the management. In general, the program includes:

1. An adequate staff of qualified physicians, nurses and attendants.
2. Emergency dispensary and hospital facilities.
3. Efficient care of occupational injuries and diseases.
4. Reasonable first aid treatment for non-occupational injuries and illnesses while on the job.
5. Physical examinations—pre-employment and periodic.
6. Adequate records of treatments and individual medical histories (confidential).
7. Supervision of plant sanitation and hygiene measures.
8. Instruction of employees in personal hygiene and safety.

Use of approved hospitals, where available, is usually more desirable than setting up elaborate facilities for surgery and treatment of serious cases. During the war the strain on public hospital facilities resulted in the expansion of many plant hospitals. In many localities public hospital facilities are still inadequate.

The Medical Director. Supervision of health and medical services should be the responsibility of a physician. Management and the medical director can formulate workable policies. Medical assistants, consultants, nurses, and others, should be selected on the recommendations of the medical director.

Full-time service of a physician may be warranted by the size of the plant or the nature of its operations. Sometimes a plant physician engages in private practice with the company's approval. He may devote part of his time to the industrial organization, assuming supervisory responsibility and delegating detail work to qualified assistants.

The doctor and the safety director follow up an injury case. (Steelways.)

For Smaller Plants

Part-Time Service. If a plant is not large enough to warrant a full-time medical director, a part-time arrangement may be the only possible solution. A physician who is present only part of the day should have definite hours at the plant.

With such an arrangement it is desirable to have a full-time nurse in attendance so that treatment will not be neglected and complete records of the work will be kept. The nurse is responsible to the physician and works under his direction.

Some plants arrange for physicians on a call basis, the doctor being summoned only in emergencies. This arrangement, however, is recommended only for the smaller plants. Under such conditions the physician is not likely to develop a real interest in the organization, nor will he be in a position to do any effective educational work.

Cooperative Programs. Where several small plants are located close together, a cooperative health service program can be carried on successfully. A central dispensary is maintained with the necessary equipment and personnel. In this way adequate service is available at a moderate cost.

Physical Examinations

Pre-employment physical examinations are standard procedure in many companies and periodic check-ups are also desirable, particularly in operations involving possible health hazards. These examinations may include vision, hearing, blood pressure, heart, chest, urinalyses. Some of these tests require special equipment.

Vision. Several companies now manufacture devices for testing visual acuity and classifying those tested for various jobs. This apparatus can be used by properly trained laymen. Employees showing visual defects are referred to oculists or optometrists for refraction tests.

Hearing. Rehabilitation of many disabled war veterans has resulted in more attention to the problems of those suffering varying degrees of deafness. By means of the audiometer, acuteness of hearing can be determined and treatment indicated. Any progressive loss of hearing, through noisy work or other causes, can be measured.

Chest. For many occupations, pre-employment and periodic examinations include X-rays of the chest. Mass chest surveys are made at regular intervals in industries where health hazards require frequent checks, and in public health campaigns to detect incipient cases of tuberculosis.

Trained technicians with mobile equipment can be engaged to conduct mass X-ray surveys.

Treatment of Injuries

INDUSTRIAL first aid is the preliminary treatment of injuries and sudden illnesses occurring on the job. In an ideal situation, each case would be handled from the start by a nurse or physician but that is not always possible.

Most injury cases in the plant and outside are first handled by laymen. Many a life has been saved because some person knew how to stop bleeding, apply resuscitation, treat shock, or splint a fracture.

Adequate service for treatment of injuries requires:

1. Competent attendants.
2. Clean, convenient quarters.
3. Medically approved equipment and supplies.
4. Proper organization.
5. Systematic records.

Staff. Facilities should be under the supervision of at least a part-time physician. A full-time registered nurse is an important and essential staff member—even in a medium-sized plant.

The next best plan is to select at least two responsible employees who have completed a standard first-aid course. These attendants handle the work under the general supervision of a doctor or nurse.

Many men received thorough first aid training in the army and navy. Their skills can often be used to advantage.

First-aid attendants should be allowed sufficient time from their jobs to keep the first-aid room in order, check supplies, and keep the necessary records. One attendant should be available during all working hours.

Quarters. A separate room should be provided for a dispensary if possible. Reasonable privacy should be provided for the patients, and if it is not practicable to partition the dispensary into a waiting room and a treatment room a screen can be used.

Small particles in the eye are easily located with this powerful magnifier.

Immaculate cleanliness in equipment and surroundings is necessary. It is no longer considered necessary to paint walls and ceilings white. Light tints in easily washable nonglaring eggshell enamel are practical and cheerful.

The first-aid room should have:

1. Good lighting; daylight if possible
2. Adequate ventilation and heating
3. Basin with hot and cold running water
4. A quiet location
5. Floors of durable and easily cleaned material
6. Toilet facilities

Equipment. For a dispensary with a registered nurse in charge under the supervision of a part-time physician, equipment might include:

1. Two white enameled chairs and a bench
2. Enameled top table or desk
3. Stool
4. One or more beds or cots
5. Linen and blankets
6. Liquid soap and dispenser
7. Sanitary can with cover
8. File for medical records
9. Floor lamp
10. Treatment table or instrument cabinet
11. Medicine chest
12. Small sterilizer
13. Small items of office and surgical equipment, such as basins, pitchers, rubber gloves (sterile), scissors, tweezers, forceps, hot water bottle, ice bag, paper cups.
14. Stretcher
15. Telephone

First aid kits. A kit located in a convenient corner of the plant is permissible only when nothing better is available. With a competent and conscientious employee in charge, it can be valuable, but too often it is useless. Employees help themselves, and contaminate absorbent cotton and bandages they do not use. Labels fall off and are lost. Some supplies deteriorate with age. The cabinet is too often used for storing cosmetics and patent medicines.

Self treatment is not desirable. Some trained and responsible person should be on hand to supervise the kit and its use. If the kit is locked, the key may be lost or the person who keeps it may be away in an emergency.

Location. The ideal location may not be available in many plants but the best possible compromise should be made. The kit should be readily accessible to the working zone, particularly where unusual hazards are

First aid kit and stretcher located at a strategic spot on a tunnelling operation.

found. In some plants more than one kit may be desirable.

In general, the following are essential:

1. Lavatory with hot and cold running water
2. Toilet facilities
3. Convenience for supervision and maintenance
4. Reasonable privacy and quiet for the patient.

Supplies. Any list of supplies should be regarded merely as a guide and the supervising physician should be consulted, particularly where any medication is involved, such as first aid antiseptics and burn dressings.

It should be remembered that these supplies and instruments are most likely to be used by laymen, and the whole set-up should be as simple as possible. Individual package dressings, kept in sterile wrappers until used, and first aid antiseptics in ampules are preferable when treatments are infrequent.

1. Tourniquet.
2. Scissors.
3. Teaspoon.
4. Medicine droppers.
5. Safety pins—assorted sizes.
6. Paper drinking cups.
7. Absorbent cotton, preferably in a covered dispenser.
8. Package of applicators.
9. Roll of 1-inch adhesive tape.
10. Gauze bandages — preferably in individual dressings.
11. Aspirin or other analgesic.
12. Dressings for burns.
13. First-aid antiseptic.
14. White wine vinegar.
15. Boric Acid—4 per cent aqueous solution.
16. Aromatic spirits of ammonia.
17. Bicarbonate of soda.
18. White petroleum jelly.
19. Finger compresses.

Reserve stocks of supplies should always be kept in the office for replenishing the kit.

Certain simple items of equipment should be near the first-aid kit. These should be available in most plants:

1. A small desk or table on which records and reports are filled out.
2. A chair or stool.
3. A small filing case for records.
4. A basin with running hot and cold water.
5. Liquid soap in a dispenser.
6. Paper towels.
7. Waste can with cover.
8. A bulletin board.

A first aid manual should be kept on hand. Every doctor has a medical library, and the first aider needs a reference book to refresh his memory and check procedure.

Dispensary records. Accurate records should be kept of all treatments. If injuries are infrequent, a small day book may be sufficient, if kept systematically. Entries should include these details:

1. Date and time of injury.
2. Date and time injury was reported for treatment.
3. Name of injured.
4. Address of injured.
5. Where and how injury was received.
6. Names, addresses and telephone numbers of witnesses.
7. Nature of injury.
8. Kind of treatment given, and by whom.
9. Whether employee returned to work after treatment; if not, when.

Health in Hot Weather

Maintaining health, comfort and efficiency in hot weather requires attention to working conditions by the employer and sensible health habits by the worker.

Good ventilation is the first essential in reducing discomfort. Adequate washroom facilities and cool, palatable drinking water are also needed. Canteens and lunchrooms also help to relieve fatigue.

Acute Ailments

Exposure to extreme heat, especially during exertion may result in heat cramps, heat exhaustion or heat stroke. Knowledge of first-aid treatment is important. All cases should have medical attention.

Heat cramps come suddenly and may involve skeletal or intestinal muscles. If respiratory muscles are involved, there may be difficulty in breathing, with resulting cyanosis. Under proper treatment, recovery is usually rapid.

Heat exhaustion is believed to be due to the effect of heat on the brain, with resulting derangement of the regulating center, and loss of body salt due to profuse sweating. Muscle cramps may or may not be present. The victim may be unconscious.

Heatstroke (often called "sunstroke") results from paralysis of the heat-regulating center. There may be severe headache, dizziness, visual disturbances and loss of consciousness, but rarely muscle cramps. The patient has a high temperature, and death may occur in a few hours.

In general, the same precautions will help to minimize all types of disability due to heat.

Serious exposures include boiler and engine rooms, foundries, steel mills, bakeries, glass plants and laundries. Seasonal heat hazards are found in construction work, public utility and highway maintenance, and farming.

Sunburn can be painful and dangerous. In strong sunlight, the head should be covered and exposure of the skin kept at a minimum. Tan should be acquired gradually. Treatment for sunburn is the same as for any other type of burn.

SALT IN DRINKING WATER

SALT is very necessary to health. Salt and water will keep you alive longer than water and food with the salt removed.

Your body consists of about 80 percent water. Salt is important in helping to keep the necessary amounts of water in all parts of your body.

But both the water and salt in your body gradually are being used up. One of the chief causes of these losses is heat which causes perspiration. A man working in summer sun or in the heat of boiler rooms, foundries, blast furnaces, bakeries, etc., may lose as much as two gallons of water through excessive perspiration in eight hours. Salt also is lost in all perspiration.

It is very necessary to replenish this salt and water lost from your body. Lack of salt is often a cause of heat cramps.

You can easily keep the salt content of your body normal by adding salt to your drinking water. Add a level teaspoonful of table salt to one gallon of water (or smaller quantities in the same proportion). Cool, not ice-cold, water is best for drinking.

Many companies provide salt for employees in tablet form, in convenient containers at the drinking fountains. Salt also should be used freely in summer foods and drinks.

SAFETY INSTRUCTION CARD No. 413

Use of Salt

Heavy manual labor, with profuse perspiration, intensifies the effects of heat due to the season or the manufacturing processes. Formerly heat cramps were frequent on these jobs. Illness was often attributed to drinking to much cold water while overheated. Now it is known that loss of body salt through perspiration is the chief cause.

Maintaining the salt in the body at an adequate level enables men to work at strenuous occupations in high temperatures. For sedentary

—*To page 186*

ANOTHER STA-SAFE PRODUCT

Be Ready When the Heat Comes!

Just to remind you that in a short time you'll be needing additional supplies of salt tablets and dispensers.

STA-SAFE
ALL-METAL DISPENSERS

The StaSafe Junior — 1500 tablet capacity, equipped with lock and key, wall bracket, and inspection window.

The StaSafe Midget — 600 tablet capacity — otherwise the same construction as the StaSafe Junior.

FAIRWAY
PLASTIC DISPENSERS

The Fairway Midget — 350 tablet capacity — otherwise the same construction as the Fairway Junior.

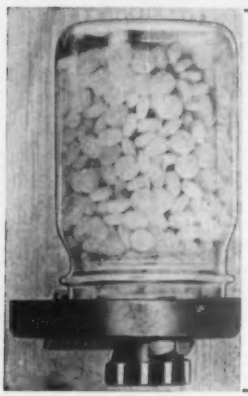
The Fairway Junior — 1500 capacity, with wall bracket, window, built-in lock and key, transparent cover over discharge spout.

A COMPLETE LINE OF SALT TABLETS

- Regular—Pure Salt Tablets.
- Enteric Coated — to prevent premature tablet dissolution which acts as a strong emetic to some workers.
- Combination — 70% Salt, 30% Dextrose, also available with enteric coat.

WRITE FOR BULLETIN NO. 258

STANDARD SAFETY EQUIPMENT COMPANY
232 W. ONTARIO • CHICAGO, ILLINOIS



ACE SALT TABLET DISPENSER
NEW—DIFFERENT
ECONOMICAL
SANITARY-95% GLASS AND PLASTIC
STRONG—SIMPLE
FOOL-PROOF

The last word in salt tablet dispensers. Holds 750 10-grain tablets. Price $2.50 each, Postpaid.
2000 salt tablets in a bag 60 cts per bag postpaid.
Liberal discount to distributors.

ACE MANUFACTURING COMPANY
PADUCAH, KY.

Skin Hygiene

SKIN diseases are the most common occupational ailments. It has been estimated that they are responsible for as much as 60 per cent of all compensation claims.

No occupation seems to be exempt, and even many normally harmless substances can irritate some skins.

There are two general types of industrial skin affections: (1) Primary irritant dermatitis; (2) Sensitization dermatitis.

Primary irritation dermatitis. Practically all persons suffer skin irritation from acids, alkalis, irritant gases and vapors, and physical agents, such as heat, cold and friction. Brief contact with a primary irritant in high concentration or prolonged exposure to a lower concentration results in skin inflammation. Allergy is not a factor in these conditions.

Sensitization dermatitis is the result of skin sensitivity to a given substance. This form requires a definite period of sensitization. During this period the offending substance causes no response unless there is contact with concentrations high enough to cause primary irritation. However, once sensitization develops, even small amounts of the material can cause symptoms.

Some substances can produce both primary irritation and sensitization dermatitis. Among them are organic solvents, formaldehyde and chromic acid.

Prevention. Primary irritation dermatitis depends essentially on exposure to relatively high concentrations of the irritant or for fairly long periods.

Mechanical methods of operation have been most successful in preventing these exposures. In some cases exhaust ventilation has been helpful.

Where mechanical methods are not practical, personal protective equipment is helpful. Aprons, sleeves, gloves, and for severe exposures even complete suits of impervious materials are available. (See Section 2—Personal Protection.)

Protective creams and lotions especially designed for different types of irritants are also helpful in minimizing skin contact. These must be used regularly and applied several times during a shift.

Personal cleanliness is essential in preventing both types of dermatitis. Frequent washing with a safe skin cleanser and warm water reduces the time the irritant is in contact with the skin. (See Section 1, Personal Service Facilities.)

In sensitization dermatitis, prevention of the original exposure is essential. This is the cause of the allergic state. Once this state is reached, even small quantities of the substance will cause trouble. Extreme care

ne source for . .

DISPENSARY and FIRST AID EQUIPMENT

If you have, or propose to install, a medical department as part of your safety program, then you should know about the A. S. Aloe Company and its completeness as *one source* for everything in medical equipment, instruments and supplies. The big Aloe catalog numbers 588 pages, contains over 25,000 items. In it you will find everything from first aid kits to complete equipment for a doctor's office. Such products as Steeline equipment, illustrated below, are characteristic. Through elimination of undesirable operating room atmosphere, new consideration is given to the employe—his state of mind, his possible apprehension, his whole attitude toward the room he enters for treatment. That we enjoy wide acceptance in the industrial field is attested by our serving, among many others, such firms as E. I. du Pont de Nemours, Shell Petroleum Co., Caterpillar Tractor Co., General Motors Corp., Curtiss-Wright Corp. Industries from the smallest to the largest refer to this *one source* for every medical department need. A large national representation insures intelligent personal service whenever desired. Address "Industrial Division," A. S. Aloe Co., for your copy of this valuable catalog.

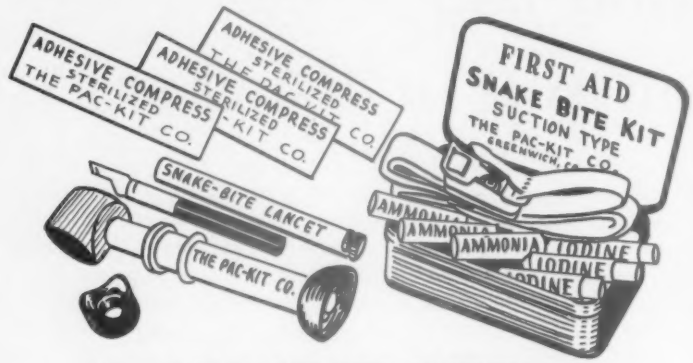
aloe

A. S. ALOE COMPANY

1831 Olive Street • St. Louis 3, Missouri

BRANCH OFFICES: 610 Third Ave. South, Minneapolis 2, Minn. • 1150 S. Flower St., Los Angeles 15, Calif.
1425 Tulane Ave., New Orleans 13, La. • 204 Bryant Bldg., 11th & Grand, Kansas City 6, Mo.

EFFECTIVE SNAKE BITE FIRST AID



No. 748 SNAKE BITE SUCTION KIT
In metal case 4 x 2½ x 1½ inches.
Weight complete 7 oz.

CONTENTS

1 Glass Venom Suction Syringe
1 Rubber Suction Cup, Large Size
1 Rubber Suction Cup, Curved Type
1 Snake Bite Lancet (P.K.Co.)
1 Tourniquet, Snake Bite Type
3 Iodine Applicators, 10 min.
3 Ammonia Inhalants, for fainting
3 Adhesive Compresses 1"

Write for Descriptive Circular and Prices.

THE PAC-KIT COMPANY
P. O. BOX 1306 **GREENWICH, CONN.**

Your Men's LIVES can be saved

by an EMERSON Resuscitator

The most effective treatment in asphyxial accidents —according to modern medical research—is immediate automatic positive-and-negative resuscitation with oxygen.

Greater ventilation is obtained than by manual methods. The negative pressure phase helps circulation. Operation of an EMERSON RESUSCITATOR is simple and safe . . . there is no known instance of injury from this method, though used many thousands of times by doctors and laymen.

In less serious cases, where breathing needs only a little aid, your EMERSON can be used as a plain INHALATOR, to supply oxygen.

Write for
Our Bibliography of Medical Research on Resuscitation.

J. H. EMERSON CO.
CAMBRIDGE 40, MASSACHUSETTS

Emerson Resuscitators are for use only by professional or other adequately trained personnel and not intended to replace manually-applied resuscitation but to supplement it. Every policeman, fireman, and responsible factory worker should know what a resuscitator can do to save lives and how to operate it.

"Simplest and Safest"

should therefore be used in handling potential sensitizers.

Tests for sensitivity in selecting workers are of questionable value. There are practical difficulties in determining sensitivity and workers are likely to be transferred from job to job with resulting exposure to a variety of irritants.

Two generalizations seem to have some basis: Negroes suffer less than whites from skin irritation, and women are more susceptible than men.

Cutting oils and compounds are frequently involved in dermatitis where cutting and turning of metals is performed. Skin affections are most commonly caused by blocking of the hair follicles by oil as well as by the defatting action which is characteristic of petroleum products.

Bacteriological tests have failed to show significant numbers of pathogenic organisms in cutting oils. If sterilization is considered necessary, heat is the preferred method. Addition of germicides may cause skin irritation.

Periodic removal of oil from the machine, filtering to remove foreign materials, and thorough cleaning of the machine before replacing are desirable measures.

Cutting compounds (oil-water emulsions) should be changed frequently. The old emulsion should be discarded, the machine cleaned thoroughly, and refilled with fresh compound.

Other occupational affections include serious lesions from contact with paraffin, pitch, coal tar, arsenic, and certain oils. Anthrax is an occupational ailment in some industries.

Medical supervision. Workers exposed to agents which produce these conditions should be examined frequently. Personal cleanliness should be encouraged by the provision of adequate sanitary facilities and by supervision and education.

Workers who suffer recurring attacks should be transferred to jobs where they will not be exposed to the offending substance.

First Aid for Isolated Groups

Where men must work at some distance from medical service, the skill and training of the first aider become increasingly important. Laymen must assume greater responsibilities for the care of the injured than in the factory. Miners, oil field workers, construction gangs, lumbermen, truck drivers, and train and boat crews come under this classification.

In such operations as many men as possible should be trained in advanced first aid. In the mineral industries thousands of men have been trained by instructors of the U. S. Bureau of Mines. Equipment should

KREISELMAN *Bellows* RESUSCITATOR

Saves Seconds that Save Lives

Civic Leaders Acclaim Amazingly Compact, Low-Cost Life Saver

While manual first aid resuscitation is often ineffective, and ordinary equipment is too bulky and costly to be kept near every potential danger spot, Kreiselman Bellows Resuscitators can be on hand everywhere for immediate, effective artificial respiration when required. *It is an invaluable supplement to major resuscitation equipment.*

This safe, effective, portable device quickly inflates the lungs with air or oxygen and removes carbon dioxide or toxic gases. Gases from the lungs cannot mix with oxygen in the bellows. Automatic valves and safety devices make errors impossible. It can be used easily and efficiently regardless of the patient's position.

Developed by World-Famous Medical Specialist

Dr. Joseph Kreiselman, noted pioneer in modern, safe resuscitation equipment used in leading hospitals and by the Army and Navy, has developed this outstanding device. It is made by The Ohio Chemical & Surgical Equipment Co., manufacturer of internationally known Heidbrink Medical Apparatus, Ohio Medical Gases and Scanlan-Morris Hospital Equipment.

Use this Emergency Equipment Wherever Breathing Failures Are Likely to Occur

● Police Cars and Ambulances ● Fire Companies

● Boat Houses and Beaches ● Schools, Mines, etc.

Here is an exceptionally effective means of artificial resuscitation — so simple, so portable, and so inexpensive that one can be kept for immediate life-saving action wherever respiratory failure may occur. The Kreiselman Bellows Resuscitator weighs only two pounds, can be stored or carried as easily as a camera, and costs *many times less* than ordinary equipment. *(Anyone can operate it effectively and safely after only a few minutes' instruction!)*

ORDER THIS LOW-COST PROTECTION NOW!
ONLY $55.00

includes bellows and valve assembly, mask, airway, elbow adapter, and carrying case.

Ohio Chemical

OHIO CHEMICAL & SURGICAL EQUIPMENT CO.
A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED
1400 E. WASHINGTON AVE. • MADISON 10, WIS.

OHIO

Ohio Chemical & Surgical Equipment Co.
1400 E. Washington Ave., Madison 10, Wis.

☐ Ship.....(quantity) Kreiselman Bellows Resuscitator at $55.00 each plus parcel post.

☐ Send complete descriptive literature.

Organization.....

Street Address.....

City.....Zone.....State.....

Order signed by.....

Title or office.....

For use only by professional or other adequately trained personnel and not intended to replace manually applied resuscitation.

be chosen with regard to the hazards likely to be encountered.

An emergency kit to be carried on the person should contain such items as:

1. Tourniquet.
2. Two 1-inch and two 2-inch roller bandages.
3. Sterile compress bandages in individual packages.
4. One triangular bandage.
5. Sterile gauze in individual dressings.
6. Safety Pins.
7. Aromatic spirits of ammonia—3 ampules.
8. Dressing material for burns.

If the kit is carried on a car or truck, splints should be added.

Snake-bite kits should be a part of the equipment in snake-infested country.

Transporting the Injured. The trained first aider always makes sure that fractures are properly splinted and the patient is treated for possible shock before he attempts to transport him.

Where there is any doubt about moving the patient, medical aid should be brought to the scene of the accident wherever possible. There are often conditions where transportation is inadvisable.

A well-constructed stretcher is desirable equipment. The army type is easy to handle and can be used as a temporary cot at the scene of the accident, during transit, and at the first-aid room or hospital. In an emergency, however, resourceful first-aiders can improvise stretchers.

Collapsible stretchers may be folded compactly when not in use and carried conveniently in an automobile.

First aiders frequently show considerable ingenuity in improvising splints, bandages and stretchers when regular equipment is not available in emergencies. Such makeshifts, however, should be used only in exceptional cases, not as a regular substitute for approved supplies.

Resuscitation Methods And Equipment

Prompt application of artificial respiration by persons trained in first aid has saved thousands of lives in cases of suspended breathing due to asphyxiation, drowning, electric shock and other causes.

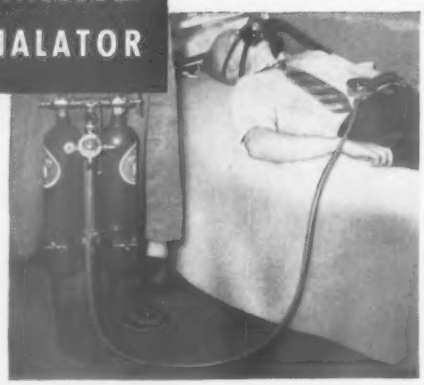
The Schafer prone pressure method is the most widely used. It is easily learned and can be applied immediately, which is important in all cases of suspended breathing.

Mechanical resuscitation equipment accepted by the American Medical Association, is used by fire departments, hospitals and by some indus-

MAINTAIN AN OUTSTANDING SAFETY RECORD IN YOUR PLANT —and reduce "lost time"—

SAFETY AWARD

Scott DEMAND INHALATOR



EMPLOYEES requiring emergency oxygen for shock, fume inhalation, heart attacks, heat exhaustion, or respiratory difficulties can be treated simply, easily and effectively with this new Scott *Demand* Oxygen Inhalator.

Portable and easy to use, the Scott *Demand* Oxygen Inhalator provides emergency treatment in minimum time—and at minimum cost. Nominal initial cost; oxygen consumption comparatively low, due to the Scott "demand" principle which assures oxygen instantly at any rate and at any volume "demanded" by the patient.

Made by the manufacturers of the widely-used Scott Air-Pak Breathing Equipment. Over 10,000 in service.

TYPE "B" Scott *Demand* Oxygen Inhalator (above). With carrying case, without cylinders $147.50

Same as above, without cylinders or carrying case $123.00

Many other models, to suit every purpose.

See the Scott Demand Inhalator at the 20th Annual Safety Convention, New York City, March 28-31 — Booth No. 49.

ESTABLISHED IN 1932 Scott FOR SAFETY—FOR SERVICE

MEDICAL DIVISION

SCOTT AVIATION CORPORATION

211 ERIE STREET, LANCASTER, N. Y.

IN CANADA: SAFETY SUPPLY COMPANY, TORONTO, ONT.

It's New!

HALCO PRESSURE BANDAGE

Recommended for:

- Large Wounds Dressing
- Control of Hemorrhaging
- Pressure Dressing for Burns
- Immobilization of Injured Areas

Descriptive folders and further information sent upon request.

A. E. HALPERIN CO., INC.

75 Northampton St.

BOSTON 18, MASS.

for industrial *First Aid*

MERCUROCHROME*

(H. W. & D. BRAND OF MERBROMIN, DIBROMOXYMERCURIFLUORESCEIN-SODIUM)

Do not neglect wounds, however small; even scratches and small cuts may become infected if they are not promptly and properly treated.

'Mercurochrome' (H. W. & D. brand of merbromin, dibromoxymercurifluorescein-sodium) is one of the best antiseptics for first aid use. It is accepted by the Council on Pharmacy and Chemistry of the American Medical Association for this purpose.

The 2% aqueous solution is not irritating or toxic in wounds; minor injuries are reported more promptly when 'Mercurochrome' is the routine antiseptic, because treatment is not painful.

'Mercurochrome' solution keeps indefinitely; the color shows where it has been applied.

Physicians have used 'Mercurochrome' for more than 28 years.

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

Be sure to include 'Mercurochrome' in your first aid supplies.

*Reg. U. S. Pat. Off

HYNSON, WESTCOTT & DUNNING, INC.

HW&D BALTIMORE, MARYLAND

tries where asphyxiation or electric shock hazards are serious and where apparatus and trained personnel are immediately available. Such apparatus can be used where injuries to the patient might prevent use of manual resuscitation.

The inhalator, which supplies a mixture of oxygen and carbon dioxide to the patient, is used with manual resuscitation. It is particularly valuable in cases of gas asphyxiation. The inhalator, by itself, does not produce respiration and should not be confused with mechanical resuscitators.

Some types of apparatus combine the functions of resuscitator, inhalator and aspirator, restoring breathing, administering oxygen-carbon dioxide, and removing from the throat secretions which might hinder breathing.

The "Eve" or rocking method uses a stretcher over a support on which the patient is see-sawed up and down. This method is used by the British Navy and the U. S. Coast Guard. A folding stretcher and support can be carried in an automobile.

Mechanical resuscitators are intended for use only by trained personnel. Application of manual resuscitation should never be delayed while waiting for apparatus.

FOR THE DAVIS D-CARTON

2 new

FIRST AID "MUSTS"

FIRST AID FOR BURNS

★ KILLS PAIN ALMOST INSTANTLY
★ ANTISEPTIC ★ GREASELESS
★ EXCLUDES AIR

Combines air exclusion, antisepsis, local anesthesia. Non-greasy, water soluble base is the perfect answer to a painlessly removable first aid for burns.

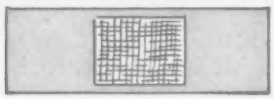
*Americaine Reg. U. S. Pat. Off.

SEND FOR BULLETIN NO. 318

*Americaine furnished in package to fit First Aid D-Carton System.

THE RIGHT DRESSING FOR EVERY FIRST AID NEED

*Band-Aid Patch Dressings 1½" square



*Band-Aid Elastic Adhesive Bandage 1"x3"

*Band-Aid Spot Dressings ¾" Diameter

*The Trade Mark of Johnson & Johnson

● Elastic ● Waterproof ● Flesh color
● Vent hole for aeration ● Sterile

SAFETY DAVIS DIVISION

DAVIS EMERGENCY EQUIPMENT CO., INC.
45 Halleck Street, Newark 4, N. J.

SEND FOR BULLETIN NO. 319

MEDICAL FACILITIES

Recommended Standards for Dispensaries and Hospitals

1. In plants of 500 or more, a full-time nurse should be in attendance, and a physician should be present at the daily dressing hour.

2. Number of treatment rooms:
50 to 500 employees..... 1
500 to 1000 employees..... 2
1000 to 5000 employees..... 3
5000 to 10,000 employees..... 5

3. For plants of more than 1,000 employees the dispensary should be equipped with modern plumbing, bath and toilet, equipment for minor surgery, and other fixtures and supplies selected by the physician in charge.

4. There should be one or more beds where severe cases may be made comfortable during observation or while waiting for transportation to a general hospital.

5. An X-ray room, if facilities are not available in a local hospital.

6. The hospital with its equipment and personnel should be under full charge of the company physician.

Outside Consultants

Surgeons. In all surgical cases where there is danger of inaccurate diagnosis or inadequate treatment, outside consultation should be called in early. Frequently, the executive and diagnostic ability of the medical director is of more importance than his skill in surgery. The plant physician should realize his limitations and refer all cases beyond his ability to a specialist or surgeon.

Oculists. Injuries to the eyes are among the most frequent of occupational injuries. The importance of the eyes is so great that highest available skill should be secured. Specialists should be summoned in all potentially serious cases.

The oculist can also serve industry in correcting defective vision among employees. The employee should, of course, have the privilege of choosing his own oculist or optometrist but frequently he will ask the advice of the plant medical department on the choice of a specialist. Where prescription goggles are indicated, some companies provide the examination.

Dentists. According to available records, injuries to the teeth are relatively infrequent. Such cases are usually sent outside for treatment. The medical department should have a list of dentists qualified to treat such injuries.

The importance of oral hygiene has led many companies to provide dental examinations, sometimes including full-mouth X-rays. The findings are usually referred to the employee's dentist since few companies provide restorative dentistry.

SAFETY SERVICES

Training Aids 179
Safety Signs 184
References 184

Training Aids

VISUAL aids have earned a permanent and important place in the teaching of safety principles and practices as well as in other phases of job training. Industry has found that, through their use, the preparation of workers in occupational skills has become faster and easier.

Among the more familiar and effective media are posters, slidefilms and movies. Directional and warning signs are standbys and specialties of many kinds, such as the **Safetygraph,** have been developed to aid the trainer in his job of impressing the worker through both sight and hearing.

Most common effective presentation of graphic display, perhaps, is the bulletin board. Strategically located for best possible circulation of plant personnel, and kept interesting by frequent changes of material, it can be most valuable in the safety program, offering forceful messages in attractive poster form and other items of interest.

It may be mounted on walls, indoors or out, or it may be supported on two uprights and roofed over. Whatever the installation, it should be kept attractive and well lighted. Glass fronts protect the displays from the weather (and from pranksters). Removable backs permit preparation of the display in the office and rapid change of "editions." The reverse side may be used as a blackboard.

For construction crews or other isolated groups of field workers, portable boards may be mounted on driven stakes or hung on the walls of tool shacks or trucks.

Location. Drinking fountains or timeclocks, entrance gates, first-aid stations, the employment office or employee meeting rooms, in plant cafeterias or wherever groups of workers congregate provide good locations for bulletin boards.

A white wall and a well-lighted corridor give this bulletin board high attention value.

Better results are obtained when more than one board is used, even in small plants. Many companies erect a board in each department, making sure it will not be obscured by the opening or closing of doors or by other obstructions.

Color. Green is a practical color for the frame and is the recognized safety color. Green blends pleasantly with the surroundings and does not detract from the display.

The inside of the frame is usually painted white or a light tint for better reflection of light.

Frequent cleaning and painting are necessary for effective displays.

Posters on a wide variety of safety subjects are available from National Safety Council, insurance companies, government agencies, and commercial concerns. Posters make use of the universal appeal of pictures, aided by brief, forceful copy. Homemade post-

—*To page 184*

For safety meetings and group instruction sound slidefilms on many subjects are available. (U. S. Smelting, Refining and Mining Company).

SAFETY POSTERS

from
NATIONAL SAFETY COUNCIL

IMPORTANT

All posters displayed on these pages, except the jumbo poster, will be available through 1950, and may be secured as a part of N.S.C. membership service, or by purchase.

Posters numbered 8700 and up are new posters. Others are among the 744 posters shown in the 1950 Poster Directory.

Write to Membership Dept. of N.S.C. for further information.

NATIONAL SAFETY COUNCIL
8925-A 8½x11½

NATIONAL SAFETY COUNCIL
8372-A 8½x11½

NATIONAL SAFETY COUNCIL
8392-A 8½x11½

NATIONAL SAFETY COUNCIL
8612-A 8½x11½

8421-A 8½x11½

NATIONAL SAFETY COUNCIL
8376-A 8½x11½

Electrotypes or poster miniatures on this page are not available, nor can payroll inserts be supplied.

Posters below are printed in two or more colors
(Available only in sizes indicated)

NATIONAL SAFETY COUNCIL

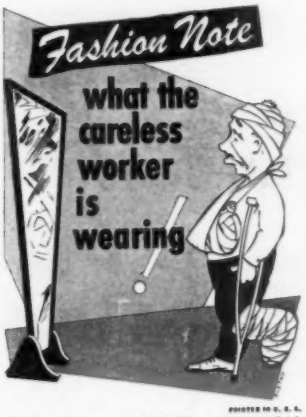
8955-C **25x38**

JUMBO POSTER for APRIL 1950

Jumbo posters 9' 11" by 11' 8" in size, designed for outdoor use, are issued monthly. They are available to members for $42.50 annual subscription.

NATIONAL SAFETY COUNCIL

8940-A **8½x11½**



NATIONAL SAFETY COUNCIL

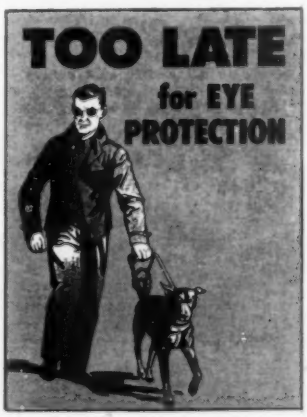
8917-A **8½x11½**

NATIONAL SAFETY COUNCIL

8946-A **8½x11½**

NATIONAL SAFETY COUNCIL

8614-A **8½x11½**



NATIONAL SAFETY COUNCIL

8924-B **17x23**

NATIONAL SAFETY COUNCIL

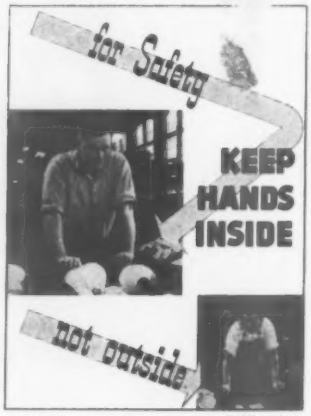
8858-B **17x23**

See box on page 180 for information about these and other National Safety Council posters.

Posters below are printed in two or more colors
(Available only in sizes indicated)

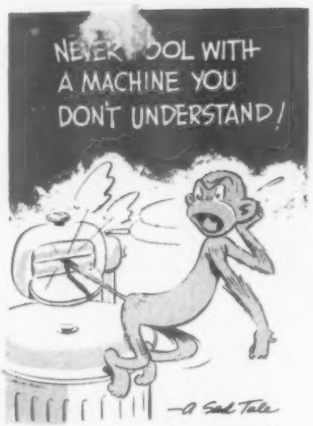
NATIONAL SAFETY COUNCIL

8914-A **8½x11½**



NATIONAL SAFETY COUNCIL

8937-A **8½x11½**



NATIONAL SAFETY COUNCIL

8472-A **8½x1**

NATIONAL SAFETY COUNCIL

8947-A **8½x11½**

NATIONAL SAFETY COUNCIL

8908-B **17x23**

NATIONAL SAFETY COUNCIL

8254-B **17x23**

NATIONAL SAFETY COUNCIL

8610-B **17x23**

NATIONAL SAFETY COUNCIL

8320-A **8½x11½**

NATIONAL SAFETY COUNCIL

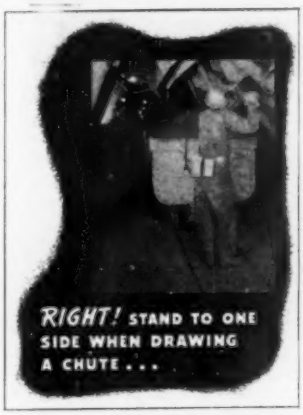
8942-A **8½x11½**

See box on page 180 for information about these and other National Safety Council posters.

Posters below are printed in two or more colors
(Available only in sizes indicated)

NATIONAL SAFETY COUNCIL

'437-B 17x23



NATIONAL SAFETY COUNCIL

8944-A 8½x11½

NATIONAL SAFETY COUNCIL

8274-A 8½x11½

NATIONAL SAFETY COUNCIL

8872-A 8½x11½

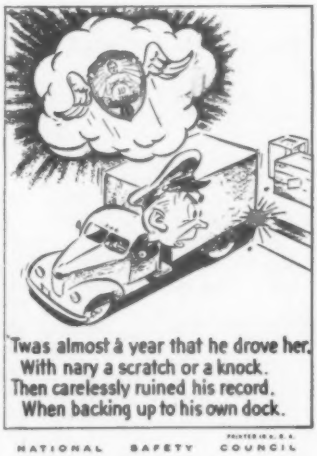
NATIONAL SAFETY COUNCIL

8229-A 8½x11½

DEFENSIVE DRIVING TIPS
If the oncoming vehicle is-
• crowding the center line
• reducing speed
• giving a left turn signal
SLOW DOWN and BE PREPARED TO STOP

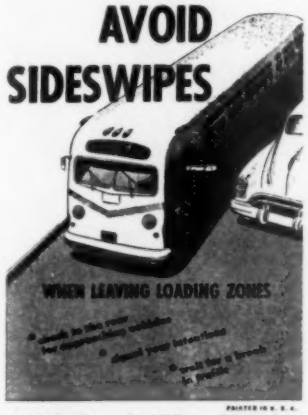
NATIONAL SAFETY COUNCIL

V-8950-A 8½x11½


'Twas almost a year that he drove her.
With nary a scratch or a knock.
Then carelessly ruined his record.
When backing up to his own dock.

NATIONAL SAFETY COUNCIL

V-8390-A 8½x11½



NATIONAL SAFETY COUNCIL

V-8951-B 17x23

NATIONAL SAFETY COUNCIL

V-8674-B 17x23

See box on page 180 for information about these and other National Safety Council posters.

Safety Signs

SIGNS are the simplest and most effective devices to warn or direct. They command attention and convey a definite message at a glance, even to the illiterate. Their almost universal use has made them familiar everywhere and the response to their directions is practically automatic.

Effectiveness of a sign depends upon its contrast, achieved through its shape, color, wording and location. Recognition of these factors has led to the adoption of standards that promote uniformity in design and color for signs that fall into various classifications. When both commercial and home-made signs conform to these standards, they will be recognized instantly as referring to certain hazards.

According to the American Standards Association code, characteristic colors for signs should be:

1. Danger—Red.
2. Caution—Yellow.
3. Safety instruction—Green.
4. Direction—Black.
5. Information—Any combination of colors, except red and yellow.

Visibility of warning signs is a first requisite. Special illumination may be necessary in poorly lighted areas.

Black on white and black on yellow are the most visible combinations. Other combinations are white on black; yellow on black; dark blue on yellow; red on white; blue on white; white on blue.

Yellow is regarded as the most conspicuous color in daylight; red can be seen most readily by artificial light.

Red is universally accepted to denote danger or fire apparatus. This should always be considered in choosing color combinations for danger signs. Its force should not be weakened by indiscriminate use.

Always use color combinations that contrast with surrounding colors so they will stand out clearly. Use only permanent colors.

Location. A warning sign is wasted if it can not be seen easily or if it is too far from or too close to the real point of danger.

Wording of signs should be brief, clear and understandable to persons with limited vocabulary.

Wherever the nature of the hazard may not be evident, the sign should if possible specify the danger, such as "Gasoline Storage."

The shorter the wording the better, but many people resent too brusque an order, however impersonal it may be. The best sign will, if it expresses more than a mere stereotyped phrase, like **stop** or **slow**, invite cooperation rather than demand conformity.

Lettering should be as large as possible, consistent with balance and legibility. Block letters are recommended for ease in reading.

The weight of line in the body of each letter should be about the same as the spaces between the lines.

Tables of distances at which well proportioned letters can be read by persons of normal vision under good lighting conditions, are given in the American Standards code referred to above. This code also offers detailed specifications on sign construction of the standard types.

Danger signs should be restricted to such immediate and serious hazards as high voltage equipment, toxic and corrosive chemicals, collision hazards, explosives, etc. Employees should be warned of their importance.

Caution signs warn employees against potential hazards, such as improper use of elevators, cluttered aisles, and sparks from grinding wheels; or against unsafe practices such as oiling machinery in motion, smoking in forbidden areas, and operating machines with detached guards.

Workers should learn to respond to a caution sign as an indication of potential danger requiring care and alertness. The difference between the **danger** sign and the **caution** sign is one of degree.

Other general types include safety instruction signs, which designate certain actions or practices, directional signs, and information signs.

Maintenance. Periodic inspection and inventory of signs should be part of the safety program. Signs should receive the same cleaning and maintenance that is given to other equipment. Dirty and disfigured signs are not convincing.

Signs which are no longer needed should be removed. Where hazards have changed, signs more appropriate to present conditions should be substituted.

Controls for machines should be padlocked and tagged while men are working on them.

REFERENCES—SECTION 7

National Safety Council:
Catalog of Occupational Safety Services.
Industrial Accident Prevention Signs—Safe Practices Pamphlet 81.
Maintaining Interest in Safety—SPP 67.
Safety Contests—SPP 74.
Teaching Safety to New Employees—SPP 65.

National Safety News:
More Power to the Voice of Safety—May 1949, p. 24.
To Get an Audience, We've Got to Be Good, by M. R. Freeman.
Safety on the Wire—Apr. 1949, p. 26.

American Standards Assn:
Industrial Accident Prevention Signs, Specifications for—Z35.1-1941.

Warning Tags

These come in a variety of stock subjects. They are attached to equipment in emergencies to warn others that men are working on machines, that a valve on a pipe line has been shut because of a leak, etc. They are also used on unsafe equipment which is to be removed from service.

Decals

Safety decals are miniature signs which can be attached permanently to machines, walls or other places where a message of warning, caution or brief instruction is needed. They conform to the standard specifications of design and color.

Training Aids

(From page 179)

ers, particularly those on local topics, add interest.

Helpful hints on effective use of bulletin boards and poster displays will be found in National Safety Council's Safe Practices Pamphlet No. 38.

Movies and Slidefilms

There are no more effective visual aids than movies, sound slidefilms and film strips. Army and Navy instructors found by test that students learned up to 35 per cent more in a given time and remembered 65 per cent longer when conventional texts were supplemented by movies and other visual aids. Safety films bring the experiences and problems of industrial operations into the meeting room.

Sound slidefilms present a series of pictures on a roll of 35 mm film with the natural sounds, commentaries, and musical interludes recorded permanently on a synchronized disc. They may be used without the sound record when extended discussion of certain sections or of individual pictures is desired.

— *To page 186*

On January 1, 1945, it was 668,000

In June, 1949, it was 800,000

Now it's well over

900,000

A. T. & T. Stockholders

No other stock is so widely held by so many people. About one family in every 50 in this country now owns American Telephone and Telegraph Company stock

---

Just last month the number of stockholders of the American Telephone and Telegraph Company reached a record high of 900,000 and it's still growing.

This is an increase of over 100,000 in eight months. The big gain is due not only to completion of the first offering of stock to employees under the Employee Stock Plan but to continued public buying.

The people who own the Bell Telephone business come from all walks of life in every section of the country. Most of them are small stockholders. 280,000 own five shares or less. More than half are women.

Over 150,000 telephone employees are now stockholders. In the next year or so many thousands more will complete payments on stock under the Employee Stock Plan.

A significant fact is that more than 350,000 A. T. & T. stockholders have been stockholders for ten years or longer. Their A. T. & T. dividend has come along regularly, in good times and bad.

They bought the stock "for keeps" because of their long-term confidence in the business and their belief that regulatory bodies will provide adequate rates for service so that they may receive a fair and stable return on their investment.

It's the widespread confidence of investors that helps make possible the good telephone service you get today.

EVERY TIME YOU TELEPHONE you share the benefits of the stockholders' investments. It's their dollars that build, expand and improve the best telephone system in the world for you to use at low cost.

BELL TELEPHONE SYSTEM

ALWAYS BE SURE

EMPLOYEES CAN READ YOUR MESSAGES

POST THEM ON

• Illuminated
• Non-Fogging
• All-Metal

DIAMOND BULLETIN BOARDS

Twenty-four hours a day, in any kind of weather, your messages posted on Diamond Bulletin Boards are easy to read because they are always illuminated, never-fogging. Sturdy all metal construction withstands toughest atmospheric conditions for years. Available in single and double units.

WRITE FOR COMPLETE DETAILS AND PRICES

SAFETY FIRST SUPPLY COMPANY
425 Magee Street, Pittsburgh 19, Pa

Training Aids

(From page 184)

Such productions are available at moderate cost. Lists of titles, descriptions and prices may be obtained from the Council.

The Safetygraph is a development of the familiar chart and easel type of poster sequence. Clear and simple photographs and drawings depict each step in the procedure for doing a job safely.

It permits the instructor to stand behind the easel, facing his audience (not more than 15 or 20 to a group), and turn the pages, one by one. As he presents each page of photos or drawings, he makes his talk from the suggested text on the back of each preceding page, or uses the printed patter as a guide in developing his own talk.

Safety Instruction Cards offer safety information in "capsule" form and cover hundreds of industrial subjects. Sometimes they are permanently mounted beside the machine or equipment to which they refer. Some plants make them available to the workers in quantities, stored in file cabinets near the time clock or foreman's office. Others assemble sets of cards relating to the hazards of a particular department.

Safety Publications

For regular reference, the safety man shou'd have at hand a number of volumes and current periodicals dealing not only with general and specialized safety problems but also those concerning operating methods of his industry. Valuable information will be found in both safety publications and trade magazines. Catalogs and handbooks issued by manufacturers should also be kept on hand.

Throughout this issue frequent reference has been made to National Safety Council publications. The Safe Practices Pamphlets, Health Practices Pamphlets and Data Sheets furnish comprehensive sources of information on a wide variety of subjects. A wealth of accident prevention and industrial hygiene information in compact form is presented in the Council's **Accident Prevention Manual for Industrial Operation.**

New books, pamph'ets and other publications are appearing regularly. These are reviewed each month in **National Safety News.** The Council also prepares a bibliography of industrial safety and health which is revised regularly.

Hot Weather

(From page 171)

workers, normal use of salt with food may be sufficient, but those whose jobs require greater physical exertion may not take enough by this method.

Dispensing. The most convenient and popular method for providing salt is in tablet form. The 10-grain size is most frequently used, and it may be obtained either as pure salt or in a combination of 70 per cent salt and 30 per cent dextrose. Tablets containing dextrose are more palatable and more easily assimilated.

For those who find difficulty in taking even a moderate amount of salt, enteric-coated tablets are available. These pass through the stomach intact and are dissolved in the intestines.

In most plants, a dispenser for salt tablets will be found beside the drinking fountain. Dispensers are made in several styles and sizes.

The drink of water which accompanies the tablet is as important as the salt.

Another method is to add salt to the water. This is practicable where the drinking water is not used in the industrial processes. Concentrations of from .1 to .5 per cent, depending upon the temperatures and nature of the work, are used in some plants.

Use of salted drinking water should be under medical supervision.

Caution. Persons with kidney or heart disease or high blood pressure

Safety made INTERESTING

TO YOUR WORKERS WHERE ACCIDENTS OCCUR

EVERY EMPLOYEE A SAFETY MAN

YOUR Safety News
Published in the interests of your safety
Your Firm Name Printed Here

PEP UP YOUR SAFETY EFFORTS WITH SOMETHING DIFFERENT

Here is **Industrial Safety at a Big Saving in Time and Money.** All the causes of accidents directed to your employees monthly. Just the way they like it with Color, Humor and Interesting Pictures that impress. How else can workers be taught to know, avoid and report Unsafe Acts & Unsafe Conditions, that cause your accidents, for so little money.

"YOUR SAFETY NEWS" MAKES ANY SAFETY PROGRAM BETTER

Write for samples and prices

FRANK O. SHOEMAKER, Publisher
6911 SOUTH CHICAGO AVE. CHICAGO 37, ILL.

Fire HAZARD SIGNS

DANGER
NO SMOKING MATCHES OR OPEN LIGHTS

DO NOT USE ON ELECTRICAL FIRES

CAUTION FIRE ALARM HANDS OFF

FOR USE ON ALL FIRES

THINK
A FIRE TO-DAY NO JOB TO-MORROW

NOTICE
KEEP THIS DOORWAY FREE OF OBSTRUCTIONS SO FIRE DOORS CAN CLOSE

CAUTION
PASSAGE TO THIS FIREHOSE MUST BE KEPT CLEAR

FIRE EXIT

USE ON OIL FIRES ONLY

One Match

MIGHT SET THE WORLD ON FIRE!

NOTHING is more devastating to the worker than to stand helplessly by while flames destroy his work place and his job.

And the worst of it is, the hand of Carelessness nearly always holds the torch.

STONEHOUSE SIGNS
For Accident Prevention

Teach your workers to mentally fight fire before it starts . . . by being careful . . . with the help of Stonehouse Fire Prevention signs.

Our complete Catalog No. 8, in full color, showing many "Fire" signs, is free on request.

"Stonehouse Signs Since 1863"

Stonehouse SIGNS, INC. MANUFACTURERS
Stonehouse Bldg. · 9th at Larimer
Denver 4, Colorado

ACCIDENT PREVENTION SIGNS IN STANDARD COLORS AND DESIGNS

DAV-SON
HIGH VISIBILITY SAFETY REMINDERS

Dav-Son Bulletin Boards are especially designed to get the maximum attention for your messages. Dav-Son equipped plants everywhere are maintaining envious safety records. Write for circular describing the many styles available.

DAV-SON
CORK BACK BULLETIN BOARDS
For Inside or Outdoor Use
- Wood or Metal Frames
- Glass Enclosed or Open
- Real Cork Mounting Surface
- Illuminated or Non-Illuminated
- Many Sizes. Low Cost.

We are manufacturers of bulletin boards for every purpose. Changeable letter directories, production control and sales bulletin boards, cork back boards, and special display boards of all types.
CONSULT US

DAV-SON
"The Safety Director"
Flashing Color, Changeable Letter Display for Timely Safety Messages. The most effective safety bulletin made. Write for special circular.

DAV-SON
A.C. DAVENPORT & SON, INC.
ESTABLISHED 1932
311 N. DESPLAINES ST., CHICAGO 6, ILL.
MANUFACTURERS OF BULLETIN BOARDS FOR EVERY NEED

MAKE THIS TEST IN YOUR PLANT

. . . see whether INCREASED VISUAL EFFICIENCY of your personnel will pay (and the trial involves no obligation on your part).

A sampling test, run on a group of your own employees, will show whether a Visual Testing program will give you the results that thousands of plants are reporting:

LOWER production costs and training costs; lower labor turnover; less spoilage; reduced accident and insurance rates.

INCREASED efficiency, larger profits; increased employee satisfaction.

YOUR SKEPTICISM is invited; it is not necessary to accept the evidence of other plants. Write for "An Occupational Visual Job Analysis."

KEYSTONE VIEW COMPANY, Meadville, Penna. Established 1892. Originators of Binocular Visual Testing in Industry.

The **KEYSTONE** *Occupational Visual Service*

should seek medical advice on the use of salt. However, such men should not be placed on jobs where they would be exposed to high temperatures or heavy manual work.

REFERENCES—SECTION 6

Industrial Medicine and Hygiene

National Safety Council:
Health Practices Pamphlets.

National Safety News:
Before He Starts Work. Milton H. Kronenberg, M. D. July, 1948; p. 20.

Health Hazards Under the Microscope. May, 1948; p. 22.

The Summer Tyrants—Heat and Humidity. May, 1948; p. 28.

United States Dept. of Labor
Numerous publications on specific subjects.

Books:

Principles and Practice of Industrial Medicine. Edited by Fred J. Wampler, M.D. The Williams & Wilkins Co., Baltimore, 1943.

Industrial Health. Kober and Hayhurst. P. Blakiston & Sons Co., Philadelphia. 1924.

Industrial Hygiene for Engineers and Managers. Carey P. McCord, M.D. Harper & Bros., New York. 1931.

Industrial Medicine. Clark and Drinker. National Medical Book Co., New York.

Occupational Medicine and Industrial Hygiene. Rutherford T. Johnstone, M.D. C. V. Mosby Co., St. Louis 3, Mo. 1947.

Industrial Health Engineering. Allen D. Brandt, John Wiley & Sons, New York. 1947.

Toxicology and Hygiene of Industrial Solvents. Edited by K. B. Lehmann and F. Flury; translated by Eleanor King and Henry F. Smyth, Jr. The Williams and Wilkins Co., Baltimore. 1943.

Noxious Gases and the Principles of Respiration Influencing Their Action. Yandell Henderson and Howard W. Haggard. Reinhold Publishing Corp., New York. 1943.

Industrial Hygiene. Edited by A. J. Lanza and Jacob A. Goldberg. Oxford University Press. 1939.

Toxicity of Industrial Organic Solvents, Summaries of Published Work. Ethel Browning. H. M. Stationery Office, London. 1937.

Lead Poisoning. Abraham Cantarow, M.D., and Max Trumper, Ph.D. The Williams & Wilkins Co., Baltimore. 1944.

Silicosis and Asbestosis. Edited by A. J. Lanza, M.D. Oxford University Press, New York. 1938.

Occupational Diseases of the Skin. Louis Schwartz, M.D., Louis Tulipan, M.D., and Samuel M. Peck, M.D. Lea and Fabiger, Philadelphia. 1947.

Women in Industry, Their Health and Efficiency. Anna M. Baetjer, D.Sc. W.B. Saunders Co., Philadelphia. 1946.

Industrial Hygiene and Toxicology. Edited by Frank A. Patty. Inter-Science Publishers, Inc., New York. 1948.

Care of the Injured

National Safety Council:

Caring for Injured Workers, Health Practices Pamphlet 8.

Teaching Safety to New Employees, Safe Practices Pamphlet 65.

Training for First Aid, Safe Practices Pamphlet 83.

Emergency Nursing Care of the Eyes in Industry (Hedwig S. Kuhn, M.D.), Safety Reprint Gen. 8.

Observations of a Company Nurse, National Safety News, Feb. 1949, p. 33.

American Red Cross:
First Aid Textbook.

U. S. Dept. of Labor, Div. of Labor Standards:
Protecting Plant Manpower, Special Bulletin No. 8.

NATIONAL SAFETY COUNCIL

occupational SAFETY SERVICES

ADMINISTRATIVE *Materials*

MAKE USE OF ALL AVAILABLE INFORMATION

NATIONAL SAFETY NEWS

This monthly magazine contains from 130 to 200 pages of timely information on industrial safety. Features articles by experts in the safety field, current accident frequency and severity statistical data, industrial health and hygiene information, news of safety training aids, a four-page section showing current safety posters, and reviews and indices of publications of interest to safety men. The NEWS is a good reference guide since leading manufacturers are all represented. The advertising pages provide a comprehensive display of all types of safety equipment. New products for accident prevention are featured in each issue.

ACCIDENT FACTS

Here is the best single source of information on accident figures and facts. Complete statistical summary of the national accident experience, with explanatory tables, charts, and illustrations. Shows average frequency and severity rates, general trend of accidents, no-injury records, etc. About 100 pages, size 6" x 9". Non-member prices same as member.

ACCIDENT PREVENTION MANUAL FOR INDUSTRIAL OPERATIONS

The encyclopedia of safety—534 pages and 400 illustrations showing exactly how to run a safety program that will step up production and increase profits. This manual should be in the library of every safety director, training supervisor, engineering and development department, and separate plant employing 100 or more workers. Handsomely bound, size 6" x 9". This comprehensive text is divided into the following section:

Plant Design and Layout, Construction and Demolition, Permanent Equipment and Facilities, Guarding and Operating Machinery, Material Handling and Storage, Electrical Hazards, Chemical Hazards, Fire and Explosive Hazards, Flammable Liquids, Hand and Portable Power Tools, Commercial Vehicle Operation, Personal Protective Equipment, Industrial Hygiene, and Safety Organization and Program. Industrial Members with 100 or more industrial workers receive the Manual as a part of their membership service.

HOTEL ACCIDENT PREVENTION MANUAL

77 page book prepared for hotel, restaurant, and service industry managers, but especially valuable for the safety director with plant restaurants and cafeterias. Thoroughly covers organizing for accident prevention, medical services and first aid, prevention of fire and panic, and training of employees. Experience-tested ideas on controlling special work area hazards in kitchens, restaurants, housekeeping and stewards departments, laundry and engineering departments, upholstery and carpentry shops, and service departments.

INDUSTRIAL SAFETY GUIDE

The revised 48 page illustrated manual is tailor-made to fit the requirements of the smaller plant or the part-time safety man. Covers all the steps necessary in setting up a safety program in smaller plants: assigning responsibility, making the plant safe, controlling unsafe practices, accident records, plus all the materials and services available to industry through the Council and other agencies. Safe practices and safety devices recommended are indispensable to efficient production. Size 6" x 9".

HOW TO MAKE THE SAFETY SPEECH

A 64-page booklet presenting the fundamentals of speech training. Designed to show safety men, supervisors and foremen how to put safety talks across to large and small groups.

SAFETY BELL RINGERS

Booklet of safety slogans useful for speeches, plant papers, bulletin boards and campaigns. A time-saver for safety men when looking for just the right punch-line. 24 pages; 6" x 9".

SPEAKING STRAIGHT — THINKING STRAIGHT

Four lectures on public speaking given at the 1946 Safety Congress by Dr. Irving J. Lee, Chairman, Department of Public Speaking, Northwestern University. 24 pages; 5½"x8½".

HOTEL INSPECTION CHECK LIST

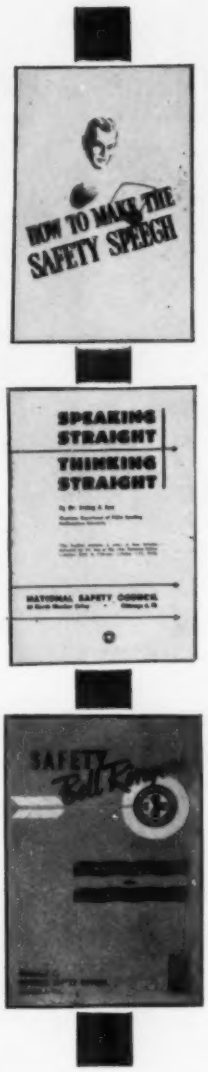
Covers various aspects of hotel facilities, to help determine whether or not safe surroundings are provided for hotel guests and employees. 8½" x 11", 2 sides; in pads of 50.

SAFETY INSPECTION CHECK LIST

A check list of safe and unsafe plant conditions. Reverse side blank for making detailed comments or recommendations. Size 8½" x 11". In pads of 50.

NATIONAL DIRECTORY OF SAFETY FILMS

The 1948-49 edition lists and briefly describes 533 motion pictures, sound slidefilms and silent filmstrips covering all phases of safety. The source of each film is listed, as well as information as to whether the film is available for purchase, rental or free loan. Same price to non-members.



MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Accident Prevention Manual, each	$8.50	$8.00	$7.50	$7.50
National Safety News				
member subscriptions, each	5.00	4.60	4.20	4.00
non-members, each	7.50	6.90	6.30	6.00
(add $1.00 for foreign, except Canada and Pan American Union)				
News Letters, subscriptions, each	1.00	.85	.75	.75
Industrial Safety Guide, each	1.00	.90	.85	.80
Accident Facts, each	.60	.55	.50	.45
How to Make the Safety Speech, ea.	.60	.55	.50	.50
Speaking Straight—Thinking Straight	.25	.20	.20	.20
Safety Bell Ringers	.30	.25	.20	.20
Safety Inspection Check List	.90	.85	.80	.75
Hotel Inspection Check List	.90	.85	.80	.75
National Directory of Safety Films, each	.25	.25	.25	.25
Construction Job Manual, each	11.50	11.00	10.50	10.00
American Standard Safety Code for Bldg. Construction	1.00	1.00	1.00	1.00
(Non-members write for prices.)				
Hotel Accident Prevention Manual	1.10	1.10	1.00	1.00
Safety in Quarry Operations	.45	.40	.35	.35

Non-member prices are double member prices unless otherwise stated.

CONSTRUCTION JOB MANUAL

A manual designed for job superintendents that combines plans for safety and efficiency under one cover. The manual includes ten Safe Practices Pamphlets on construction subjects, twenty-five Construction Detail Sheets, seven Industrial Data Sheets, fifteen miscellaneous job forms, twenty-four pages of text, and eight pages of plans in leather binder.

AMERICAN STANDARD SAFETY CODE FOR BUILDING CONSTRUCTION

Sponsored by American Institute of Architects and National Safety Council, and approved by the American Standards Association. 86 pages; size 7¾" x 10⅝".

SAFETY IN QUARRY OPERATION

This 45-page manual presents safety rules and regulations covering both the equipment and the work methods used in quarries. Electrical equipment, explosives, material storage, drilling, welding, fire prevention . . . are a few of the subjects discussed.

NEWS LETTERS

Monthly publications dealing with accident prevention within given industries. 4 to 6 mimeographed 8⅜" x 10⅞" pages. News letters are published for:

- AERONAUTICAL INDUSTRIES
- AIR TRANSPORT
- AUTOMOTIVE AND MACHINE SHOP
- CEMENT AND QUARRY
- CHEMICAL
- COAL MINING
- COMMERCIAL VEHICLE
- CONSTRUCTION
- ELECTRICAL EQUIPMENT
- FOOD
- GLASS AND CERAMICS
- HOSPITAL SAFETY SERVICE
- INDUSTRIAL NURSING
- MARINE
- MEAT PACKING, TANNING AND LEATHER PRODUCTS
- METALS
- MINING (OTHER THAN COAL)
- PETROLEUM
- POWER PRESS
- PRINTING AND PUBLISHING
- PUBLIC EMPLOYEE SAFETY COMMITTEE
- PUBLIC UTILITIES
- PULP AND PAPER
- RAILROAD
- RUBBER
- TEXTILE
- TRANSIT
- WOOD PRODUCTS

ADMINISTRATIVE *Materials*

SAFE PRACTICES, HEALTH PRACTICES, and SPECIAL INDUSTRIES PAMPHLETS

Safe Practices Pamphlets are detailed studies of subjects important to safety supervisors. All the 147 pamphlets listed on these pages were prepared through the cooperative efforts of Council member companies. The practices and procedures contained in the pamphlets reflect the collective experience of hundreds of industrial concerns; the recommendations made are based on methods which have been tested and proved successful.

The General Safe Practices Pamphlets and Health Practices Pamphlets are available as a set, in four looseleaf binders. Special Industries Pamphlets must be ordered separately. Separate binders are stocked for those who prefer to make up a partial set of selected pamphlets.

The dates following the titles indicate the year of issuance or latest revision. Existing sets may be brought up-to-date by ordering the individual pamphlets which have been revised since the set was purchased. Numbers omitted in this list have been discontinued, or are out of stock and will not be reprinted until extensive revisions are completed.

PAMPHLETS FOR SPECIAL INDUSTRIES

Au-1 Heat Treating *1938*
Au-2 Motor Block Testing *1945*
Ce-1 Mercantile Establishments *1941*
Cem-1 Cement Rock Quarrying and Crushing *1943*
Cem-2 Raw and Finished Cement Mill Grinding *1941*
Cem-3 Cement Burning *1940*
Cem-4 Cement Mill Shops *1941*
Cem-5 Storing, Packing and Shipping Cement *1940*
Cem-6 Cement Mill Yards and Railroads *1940*
Chem-1 Chemical Pipe Lines and Tanks *1941*
Chem-2 Fume Poisoning from Nitric and Mixed Acids *1940*
Chem-3 Chemical Burns *1937*
Chem-5 Pyroxylin Lacquer Manufacture *1941*
Chem-6 Cyanide Compounds *1940*
Chem-7 Industrial Waste Disposals and Bibliography on Chemical Wastes *1948*
Con-1 Building Construction *1942*
Con-3 Excavation Work *1942*
Con-4 Pile Driving *1948*
Con-5 Demolition of Structures *1949*
D-6 Garages and Repair Shops *1941*
F-2 Candy, Chocolate and Cocoa Manufacture *1929*
F-3 Bakery Operations *1941*
F-4 Milk Bottling Plants *1939*
F-5 Macaroni Plants *1930*
Hy-1 State Highway Employees *1943*
M-2 Mine Rescue Work *1937*
Mar-2 Marine Boilers *1938*
Me-2 Blast Furnaces *1938*
Me-4 Rod Mills *1930*
Mun-1 Public Employees *1945*
PP-2 Paper Box Manufacturing *1936*
PP-3 Pulpwood Logging *1947*
PT-1 Leather Tanneries *1942*
PU-1 Protecting Public Utility Employees on Streets and Highways *1938*
PU-3 Linemen's Rubber Protective Equipment *1943*
PU-4 Handling of Poles *1939*
PU-5 Atmospheric Conditions in Underground Structures *1947*
Ref-1 Ice Delivery *1940*
Ref-2 Ice Processing Machines *1941*
RR-1 Railroad Track Cars (Hand and Motor) *1944*
Ru-1—Part I Compounding Materials Used in the Rubber Industry *1945*
Ru-2 Vulcanizers and Devulcanizers *1949*
T-1 Cotton Mills *1947*
Voc-1 Coordinating Safety in Industrial and Vocational Training Programs *1941*
W-2 Operating Commercial Lumberyards *1932*

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4. Overhead Traveling Cranes *1939*
6. Fiber Rope *1935*
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16. Protective Clothing *1941*
17. Plant Yards and Grounds *1938*
18. Power Presses *1942*
19. Exits, Fire Alarms and Fire Drills *1943*
20. Woodworking Machinery and Equipment *1939*
21. Industrial Accident Records and Analysis *1946*
22. Industrial Shop Lighting *1941*
23. Gas Welding and Flame Cutting *1941*
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25. Acids and Caustics *1941*
26. Wire Rope *1937*
27. Industrial Sanitation (Drinking Water, Wash and Locker Rooms and Toilet Facilities) *1941*
29. Electric Equipment in Industrial Plants *1938*
31. Industrial Fire Causes and Prevention *1939*
32. Exhaust Systems *1939*
33. Hoisting Apparatus *1939*
34. Industrial Explosion Hazards (Gases, Vapors and Flammable Liquids) *1941*
35. Conveyors *1939*
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37. Industrial Ventilation *1939*
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39. Machine Shops *1945*
40. Suggestion Systems *1941*
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44. Cutting Oils and Emulsions *1941*
45. Industrial Housekeeping *1941*
46. Fuel Handling, Storing and Firing *1940*
47. Compressed Air Machinery and Equipment *1939*
48. Railroads in Industrial Plants *1942*
49. Steam Boilers—Construction and Equipment *1939*
50. Reducing Fatigue *1940*
52. Static Electricity *1942*
53. Checking Plans and Specifications for Safety *1942*
54. Manual Handling of Materials *1947*
55. Industrial Power Trucks and Tractors *1940*
59. Warehouses and Shipping Rooms *1942*
60. Chemical Laboratories *1942*
61. Mechanical Refrigeration *1937*
64. Respiratory Protective Equipment *1938*
65. Teaching Safety to New Employees *1941*
67. Maintaining Interest in Safety *1948*
68. Pressure Vessels—Fired and Unfired—Steam Jacketed Vessels, Digesters, Stills, Blow Cases, Autoclaves, etc. *1939*
70. Maintenance and Repair Men *1944*
71. Chlorine *1936*
72. Safety Committees *1939*
73. Foundries *1938*
74. Safety Contests *1946*
75. Safety Inspections *1941*
76. Portable Electric Hand Tools *1940*
77. Safety Meetings *1937*
78. Mathematical Tables and Data for the Safety Engineer *1939*
(Revised 1944; not copyrighted)
80. Industrial Safety Rules—Their Formulation and Use *1941*
81. Industrial Accident Prevention Signs *1943*
84. The Safety Man in Industry *1939*
85. Forging and Hot Metal Stamping *1934*
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88. Identification of Piping Systems *1937*
91. Spray Coating *1940*
93. Topics for Safety Meetings *1943*
95. Compressed Gases *1939*
96. Industrial Power Departments *1938*
97. Pulverized Coal Systems *1940*
98. Use and Care of Hoisting Chains *1943*
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100. Safety Stunts—Part I *1935*
101. Safety Stunts—Part II *1937*
102. Off-the-Job Accidents *1938*
103. Purchasing for Safety *1939*
104. Dust Explosions *1941*
105. Electric Welding *1941*
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10. Skin Affections *1942*
11. Nursing Service in Industry *1947*
13. Physical Defects *1931*
16. Physical Medicine in Industry *1946*
17. Back Injuries *1936*
18. Lighting and Health *1941*
19. Illness in Industry *1946*

MEMBER PRICES

	1 to 9	10 to 99	100 to 999	1000 or more
Safe Practices Pamphlets any selection, each	$ .40	$ .35	$ .30	$ .29
Sets (in 4 binders) each	33.00	32.00	32.00	32.00
Single binders, each	2.50	—	—	—
Set of 4 binders	8.00	—	—	—

Non-member prices are double member prices.

ADMINISTRATIVE *Materials*

DATA SHEETS

Each is a concise, authoritative discussion on one specific safety subject. Size 8½" x 11"; one to four pages. A Current Set, complete in 3-ring loose-leaf binder, is available. Individual Data Sheets may be ordered from the list below. Additions are constantly being made to the list. A new Data Sheet appears in every issue of the NATIONAL SAFETY NEWS. Data Sheets revised since first printing show revision dates after the titles.

MEMBER PRICES

	1 to 9	10 to 99	100 to 999	1000 or more
Data Sheets, any selection, each	$ .15	$ .11	$ .07	$ .06
Current Set, including binder, each	11.00	10.50	10.00	10.00

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LIST OF DATA SHEETS

Acetic Acid ..... D-Chem. 29
Acetone ..... D-Chem. 23
Acid, Removing from Carboys (rev. 11-39) ..... D-Chem. 9
Air Compressors and Receivers, Cleaning ..... D-Me. 14
Airplanes, Electrical Grounding of ..... D-A 1
Aniline ..... D-Chem. 24
Antimony and Its Compounds ..... D-Chem. 22
Arsenic and Its Compounds ..... D-Chem. 13
Asphalt ..... D-Chem. 30
Automotive Equipment Operators on Airport Ramps ..... D-A. 2
Auxiliaries, see Slashers

Babbitting Bearings ..... D-Me. 24
Barrels, Tumbling ..... D-Gen. 18
Barricades & Warning Devices for Highway Construction Work ..... D-Con. 6
Blasting, Stray Currents in Electric ..... D-Min. 2
Bleaching Compounds, Textile ..... D-T 1
Blow Torches and Plumbers' Furnaces, Gasoline ..... D-Gen. 6
Boring Machines, Wood and Hollow Chisel Mortisers ..... D-W 6
Boring Mills, Horizontal Metal ..... D-Me. 6
Boring Mills, Vertical Metal ..... D-Me. 8
Bottles and Broken Glass ..... D-F. 2
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Drill Presses, Metal Working ..... D-Me. 4
Drilling in Mines ..... D-Min. 7
Drinking Water on Construction Jobs ..... D-Con. 3
Drop Hammers and Drop Forges ..... D-Me. 10
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Dry Ice (Solid Carbon Dioxide) (rev. 2-40) ..... D-Chem. 11

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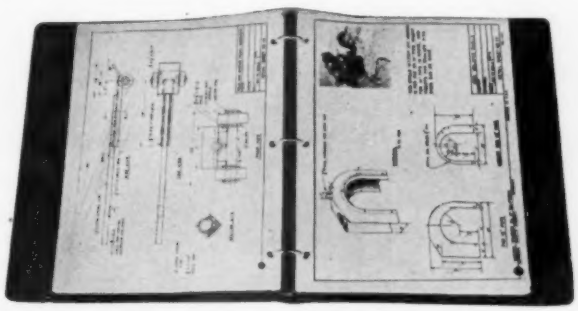
DETAIL SHEETS

Working drawings for made-on-the-job safety devices. Designed for use by foremen and workmen. 8½" x 11".

LIST OF DETAIL SHEETS

1. Light Trades Scaffold Horses
2. Heavy Trades Scaffold Horses
3. Tire Safety Racks
4. Removable Bench Seats for Pickup Trucks
5. Dump Truck Safety Block
6. Light Duty Independent Pole Scaffold
7. Heavy Duty Independent Pole Scaffold
8. Single Cleat Ladder
9. Double Cleat Ladder
10. Drinking Water Cooler
11. Single Pole Scaffold for Light Duty
12. Single Pole Scaffold for Heavy Duty
14. Removable Plank Seats for Pickup Trucks
15. Plank Seats for Stake Body Trucks
16. Hinged Seat for Pickup or Stake Trucks
17. Infirmary for Construction Projects
18. Portable First-Aid Station
19. Dump Truck Cab Protector
20. Dump Truck Safety Prop
21. Horse Barricades
22. Fence Barricade
23. Roofing Scaffolds
24. Safety Rack for Tools
25. Circular Saw Guard
26. Sidewalk Shed
27. Body Locks for Dump Trucks
28. Portable Magazine
30. Pneumatic Can Opener
31. Welding Screen & Rod Supply Box
32. Adjustable Stand for Barrel Skids
33. Safety Tongs for Handling of High Voltage Cable
34. Rivet Scaffolds
35. Bricklayers' Square Scaffold
37. Welding Screen



38. Welding Table and Safety "V" Block
39. Two Cylinder Welding Truck
40. Single Cylinder Welding Truck
41. Portable Floodlight Tower
51. Broken Glass Disposal Unit
52. Broken Glass Disposal Cans
53. Steam Valve Control
54. Interior Arrangement of Section Toolhouse
55. Air Hose Coupling Hooks
56. Power Brake Treadle Stop
57. Pipe Welding Shield
58. Shuttle Guard
59. Dolly for Moving Heavy Machinery
60. Hand Truck Attachment for Handling Dock Plates
61. Strainer for Loading Machine Spraying
62. Roller Tool for Threading Paper Calenders
63. Sidewalk Hatch Cover Brace
64. Chisel Bar Holder
65. Pedestrian Guard Rail
66. Safety Chains for Locomotives
68. Sliding Rail Brake
69. Nip Guard on Cameron Winder
70. Winder Shaft Dolly
71. Bottle Carrier for Corrosive Liquids
72. Lift Truck Safety Rack
73. Safety Handle for operating Switches, etc.
74. Emergency Stop for Belt Conveyor
75. Portable Work Stand
76. Pit Guard
77. Safety Devices at Pinch Points on Power Driven Conveyors
78. Paper Roll Skinners
79. Glass Shield for Test Stands
80. Circuit for Dead Man Control on Mine Locomotives
81. Details & Assembly of the Selnmour chute
82. Chute Platforms and Car Stop
83. Mine Car Dumping & Chute Bar
84. Hatch Cover Fastener For Bulk Cars
85. Shift Bar Safety Lock
86. Mobile Stretcher
87. Safety Levers on Carton Punching Press
88. Smoking Booth
89. Two Winder Guards
90. Overhead Guard for Fork Lift Truck
91. Testing Relief Valves
92. Reel Guard on Felt or Paper Machine
93. Cover over Handle of Stoper
94. Handle for Stoper
96. Fire Hose Holder
97. Nail Keg Band Crimper
98. Impact Test for Heat Treated Lens
99. Plant Railroad Crossing Gate
100. Winder Guard
101. Guard for Band Saw Point of Operation
103. Jointer Guard
104. Mist Projector
105. Method of Suspending Canvas from Plates in Roof Bolting in Mines
106. Wire Hanger for Roof Bolting Sections in Mines
107. Hand Guard for Short Stoper in Mines
108. Pipe Support for Roof Sections in Mines
109. Equipment Cart for Roof Bolting

MEMBER PRICES

	1 to 9	10 to 99	100 to 999	1000 or more
Detail Sheets, any selection, each	$ .10	$ .08	$ .07	$ .06
Current Set, including binder, each	8.00	7.50	7.00	7.00

Non-member prices are double member prices.

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ADMINISTRATIVE *Materials*

HOSPITAL SAFETY SERVICE

A monthly packet of hospital safety materials, including posters, instructional materials for personnel training and information for administrators. Non-member price same as member.

INDUSTRIAL SAFETY AND HEALTH BIBLIOGRAPHY

A directory on industrial safety and health. Indexed with source listings. 70 pages.

ACCIDENT ANALYSIS CHART

For use by small plants, hotels and other service industries to record frequency rates and general accident history of the organization. Size 8½"x11", 2 sides; in pads of 50.

ACCIDENT RECORD FORMS

For use in recording, reporting, and analyzing various types of accidents. Please use both number and name of form when ordering.

IS-1A—Supervisor Accident Report (8½" x 11" 2 sides).
IS-3 —Industrial Employee Injury Record (4" x 6" 1 side card).
IS-4 —Industrial Injury Summary (8½" x 11" 2 sides).
IS-5A—Monthly Summary of Industrial Injuries (8½" x 14" 1 side).
IS-6 —A First Aid report form. In pads of 100. (Size 4" x 6".)

TRANSACTIONS OF THE NATIONAL SAFETY CONGRESS AND EXPOSITION

The National Safety Congress is the biggest annual event in safety—a week of talks and panel discussions by leading safety authorities. These are recorded in separate volumes to permit wide distribution of pertinent volumes within an organization. Prices vary with number of pages. See back of cover of any volume.

• LIST OF VOLUMES

General Sessions and Detailed Index to all Volumes
Aeronautical Industries
Air Transport Industry
Automotive and Machine Shop Industries
Cement and Quarry Industries
Chemical Industries
Coal Mining Industry
Construction Industry
Electrical Equipment Industry
Farm Safety
Food Industry
Glass and Ceramics Industry
Home Safety
Industrial Nursing
Industrial Subject Sessions (Sponsored by ASSE)
Maritime Industries (Marine Section)
Meat Packing, Tanning and Leather Industries
Metals Industry
Mining Industry
Motor Transportation Industry (Commercial Vehicle Section)
Petroleum Industry
Power Press Operations
Printing and Publishing Industry
Public Employment (Public Employees Safety Committee)
Public Utilities Industries
Pulp and Paper Industry
Railroad Industry
Rubber Industry
School and College Safety
Textile Industry
Traffic Safety
Wood Products Industries
Here's to Your Talking (Early Morning Sessions)

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12 pages	.35	.30	.24	.18
16 pages	.45	.35	.30	.25
18 pages	.50	.40	.35	.30
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IS-6 (pads of 100)	.30	.30	.30	.30
Accident Analysis Chart	.90	.85	.80	.75
Accident Rates Pamphlet, each	.30	.30	.25	.25
Transactions, sets, each	6.00	5.50	5.00	5.00
Industrial Safety & Health Bibliography	.50	.45	.40	.40
Hospital Safety Services, subscription, each	5.00	—	—	—

Non-member prices are double member prices.

PACKAGE PROGRAMS

Council engineers will prepare plans for an intensive, short-term campaign covering any specific subject requiring safety instruction for employees. Samples of materials to be used and suggestions on how to use them will be included.

SPECIAL RELEASES

The various special releases of Accident Facts Memos, Engineering Studies, and Safety Reprints are listed below. When ordering, please give full number and title of the releases desired. Size 8½"x11". Prices vary with number of pages.

ACCIDENT FACTS MEMOS

General 1 —Ladder Accidents. 2 pages.
General 2 —Power Saw Accidents. 2 pages.
General 3 —Hammer Accidents. 2 pages.
General 4 —Belt and Pulley Accidents. 2 pages.
General 5 —Hoisting Operations. 4 pages.
General 6 —Grinding Wheel Accidents. 4 pages.
General 7 —Stairway Accidents. 4 pages.
General 8 —Metal-Working Lathe Accidents. 4 pages.
General 9 —Wrench Accidents. 4 pages.
General 10—Handling Materials and Objects. 4 pages.
General 11—Scaffold Accidents. 4 pages.

ENGINEERING STUDIES

Coal Mining 1—Underground Haulage Fatalities in Coal Mines. 18 pages.
Mining 1—An Analysis of 100 Fatal Accidents in the Use of Explosives. 6 pages.
Mining 2—Fatal Haulage Accidents. 4 pages.
Mining 3—Fatal Accidents from Runs of Ore or Fill. 4 pages.
Mining 4—Reflectorized Signs for Mines. 2 pages.
Mining 5—An Analysis of 100 Fatal Shaft and Hoisting Accidents. 8 pages.
Pulp and Paper No. 1—Cutting Tails on Back Side of Calendar Stack. 4 pages.

SAFETY REPRINTS

General 1 —We Fix Responsibilities. 4 pages.
General 2 —How Industry Protects the Worker's Eyes. 8 pages.
General 3 —Emergency Nursing Care of the Eyes in Industry. 4 pages.
General 4 —Scientific Facts Concerning Electrical Hazards. 4 pages.
General 5 —Health Aspects of Welding. 4 pages.
General 6 —Lightning and How to Dodge It. 2 pages.
General 7 —Aluminum and other Metal Ladders. 2 pages.
General 8 —Silica-Bearing Dusts. 8 pages.
General 10—Try Color. 4 pages.
General 11—Oil Absorbents. 2 pages.

Coal Mining

CMST 3-2-1—What Should a Mine Safety Inspector Look For? 6 pages.
CMST 5-1 —A Course of Training Foremen for Safety Work 2 pages.
CMST 7-1-1—What Do We Actually Know About Roof Testing? 4 pages.
CMST 9-3-1—Electric Blasting Underground (in coal mines). 6 pages.
SRCM 5 —The Necessity of Active Participation of Management in Safety Work. 2 pages.
SRCM 6 —Methods of Stimulating Interest in Safety Work—Safety Incentives. 2 pages.
SRCM 7 —Safety Precautions in Shuttle Car Operation. 2 pages.
SRCM 8 —A New Plan for Rating Section Foremen. 4 pages.
SRCM 9 —Proven Methods of Educating Miners in Safety. 2 pages.
SRCM 10—Maintaining Rock Dusting and Other Disaster Preventive Measures in Multiple Shift Operations. 2 pages.
SRCM 11—Ventilation Methods and Installations. 4 pages.
SRCM 12—Training Personnel in the Problems of Mechanical Mining. 4 pages.
SRCM 13—Seat for Helper on Cutting Machine. 1 page.
SRCM 14—Air Sample Bottle. 1 page.

Mining

Mining 1—Hoisting Rope Research in Ontario Mines. 16 pages.
Mining 2—Grounding Electrical Equipment at Open Pit Iron Mines. 4 pages.
Mining 3—Methods of Cementing Diamond Drill Holes and Construction of Underground Air Receivers. 8 pages.

Construction

CST 1 —Prevention of Accidents in Use of Bulldozers. 4 pages.
CST 2 —Wrecking and Demolition. 2 pages.
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CST 6 —Pre-Employment Examination of Construction Workers. 4 pages.
CST 7 —The Measurement and Prevention of Eye Flash. 2 pages.
CST 8 —The Safe Handling and Placing of Concrete. 2 pages.
CST 9 —Keeping Your Construction Equipment Safe. 10 pages.
CST 10—Safe Use of Heavy Duty Equipment in Construction Jobs. 8 pages.
CST 11—The Highway Engineer Is a Safety Man. 4 pages.

Food

Food 1—Fumigating Facts. 2 pages.

Public Utility

SRPU 1—Plan a Safe Job at the Tailboard. 2 pages.

Textile

Textile 1—Card Fires—How to Prevent Them. 2 pages.

ACCIDENT RATES PAMPHLETS

These pamphlets review the accident experience of about 200 industries and about 30 general groups. The pamphlet for your industry will enable you to compare your company's accident frequency and severity rates with those of other companies doing similar work.

LIST OF PAMPHLETS

Automobile
Chemical
Construction
Food (Food, Meat Packing, Tobacco)
Foundry
Iron and Steel Products (Sheet Metal, Misc. Iron and Steel Products)
Leather
Lumber and Woodworking
Machinery and Electrical Equipment
Mining and Quarry
Miscellaneous (Office, Miscellaneous Manufacturing, etc.)
Non-Ferrous Metals and Their Products
Pulp and Paper (Pulp and Paper, Printing and Publishing)
Petroleum
Public Utility (Electric, Gas, Communications, Misc. Utilities)
Rubber
Service (Laundry, Hotel, Mercantile, etc.)
Steel
Stone, Clay and Glass Products
Textile
Transportation (Transit, Air Transport, Marine, and Warehousing and Storage)
Transportation Equipment (Shipbuilding, Air Craft, and Railroad Equipment)

ADMINISTRATIVE *Materials*

MEMBER TRAINING COURSES

At least five times yearly, the Council conducts a course in the fundamentals of industrial safety. The safety directors who attend this Basic Safety Training Course say it is ***"The most valuable, one-week training program that has ever been accessible to safety men."***

A SOLID FOUNDATION FOR SAFETY SUCCESS

There are certain things every safety man *must* know in order to prevent accidents. He must know how to organize a safety program, what records to keep and how to use them, how to make the plant safe, etc. These are some of the fundamentals taught in the Basic Safety Training Course. Service Guide 1.6 lists the subjects.

Obviously, no one can learn in one week all there is to know about running a safety program. The main purpose of the course is to provide a solid foundation of safety knowledge. Then, to supplement the information presented in the course, each person is given a kit of reference materials that may be used for follow-up study.

TAUGHT BY EXPERTS

The lecture on the industrial safety movement is by one of the first professional safety engineers, and a recognized leader in the safety movement. The speaker on industrial health hazards is the Council's industrial research director, and one of the country's leading industrial hygienists. Each course lecturer is an expert in the particular phase of safety he discusses. It has been said that the course is "the finest presentation of safety in the country today."

OPEN TO ALL COUNCIL MEMBERS

There are no educational requirements, no experience requirements. Anyone who works for a Council member may take the course. The tuition is $50, including the cost of the reference materials given to each participant.

ALSO AN ADVANCED COURSE

It is open to persons who have completed the Basic Course, and includes: technical writing, public speaking, psychology in safety, visual aids, etc. Write the Council's Training Director for further details.

SPEAKERS BUREAU

A file on both volunteer and professional speakers maintained to place you in touch with persons qualified to address various types of audiences.

MEMBERSHIP SERVICES

Members are entitled to unlimited use of all Council facilities, without cost. Make sure you get the most out of your membership by taking advantage of the services listed below.

CONSULTATION SERVICE

A staff of safety engineers and industrial hygienists are at your service. Whenever a safety problem arises the Council's Industrial Department will help you work out the best solution.

LIBRARY SERVICE

The Council Library contains the world's largest collection of safety publications, articles and photographs. Free or loan material on any subject is sent to members upon request.

NATIONAL SAFETY CONGRESS

A week of talks and panel discussions by the leading safety authorities, held each year in Chicago during October. More than 10,000 safety people attend. It's the time when you meet, talk and exchange ideas with safety men in your own industry.

EMPLOYEE PUBLICATIONS SERVICE

The Council, upon request, will furnish sets of mats or reproduction proofs of safety cartoons and a regular safety "clip sheet" to help you keep safety in your own publications.

SECTIONAL CONTESTS

These 13 Sections sponsor yearly contests: Aeronautical Industries, Chemical, Foods, Marine, Metals, Pulp and Paper, Petroleum, Public Utilities, Rubber, Textile, and Transit. Any affiliate who sends in an entry form between July 1 and September 15 may compete. The only requirement is a simple monthly report. Entrants compete only with companies of their own size which have similar operations. Each month you receive a report of your standing. If you win, there's a handsome trophy that's yours to keep. The Council will send you contest posters, report forms, and the contest rules upon request.

PERSONNEL BUREAU

A Council service to help members find the right man for a safety job.

SUPERVISOR *Training*

Supervisors are key men in your safety program. Ever since the beginning of safety work, a great deal of emphasis has been placed on safety training for foremen. Since your supervisors give on-the-job instruction, distribute safety material, make sure protective equipment and machine guards are used, and enforce your safety rules, you will want to make sure they continue to cooperate in making your safety program a success. Here are selected materials to do the best job of safety-training.

These materials have two important functions:

- TO HELP YOU teach your foremen the A B C's of accident prevention—as it relates to themselves and to their jobs.
- TO HELP YOU show your foremen how safety and production go hand in hand—and that both are their responsibility.

INDUSTRIAL SUPERVISOR

The best magazine on the market for selling safety to foremen. In fact, the only one published that consistently, month in and month out, drives home the idea that safety and production go hand in hand—and both are the responsibility of your foremen.

Each issue includes: an article on a phase of safety particularly interesting to foremen; a two-page photo story on a specific hazard; a how-to-do-it page; a genial editorial by the Arm Chair expert; a limerick contest to stir up extra interest in safety.

SAFETY IN FOREMANSHIP

A set of 12 pamphlets, each devoted to an outstanding phase of the accident problem, and treated wholly from the foreman's viewpoint. These pamphlets provide a ready-made course for teaching the principles of accident prevention to foremen. An instructor's outline suggesting ways to present the material to foremen, and a series of questions and answers for each booklet are provided with the set.

HUMAN SIDE OF SAFETY IN FOREMANSHIP

A set of 6 pamphlets analyzing the human factors in accident prevention work. The author and well-known psychologist, Dr. J. L. Rosenstein, designed the pamphlets so they may be used for either individual or group study. Used as the basis for a series of meetings, they stimulate some lively discussions on how to handle people. An instructor's manual is provided with each set.

3 OUTSTANDING FOREMEN TRAINING AIDS FOR YOUR SAFETY PROGRAM.

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Industrial Supervisor, subscriptions	$1.65	$1.55	$1.50	$1.45
Safety in Foremanship, sets	1.70	1.50	1.30	1.25
Human Side of Safety in Foremanship, sets	.80	.75	.65	.55

Non-member prices are double member prices.

OCCUPATIONAL SAFETY SERVICES

SUPERVISOR *Training*

There is a real need for showmanship today. Films enable you to tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training time in half, give fewer refresher courses, and get better results by using the safety films of these pages.

Whether it is foremen or worker training you are interested in, here are films that will help you arouse and keep alive interest in your safety program. There is no better way to teach foremen how to be better safety supervisors.

HUMAN FACTORS IN SAFETY

Human Factors In Safety is a series of six 35 mm sound slidefilms with Leader's Manuals that may be used for a 12-15 hour advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train new workers, how to keep experienced workers on their toes, and how to win respect, cooperation, and loyal support.

1. THE SECRET OF SUPERVISION sets the stage for the other films in the series. In story form, it shows why people will work hard for some supervisors, yet resent and rebel against others.

2. TEACHING SAFETY ON THE JOB shows supervisors how to prepare and give job safety instructions. The four steps of good job training illustrated are: 1. Prepare; 2. Present; 3. Apply; 4. Test.

3. PEOPLE ARE ALL ALIKE explains that all normal people have certain basic, human wants. The film shows how supervisors can satisfy these wants — and by so doing, get their men to work WITH them.

4. PEOPLE ARE DIFFERENT shows supervisors how to make allowances for individual differences — how to handle the tough guy, the show-off, the loud-mouth, the day-dreamer, and the practical joker.

5. TEAMWORK FOR SAFETY suggests ways for supervisors to make safety interesting. Holding meetings, encouraging worker suggestions, using safety literature . . . are some of the techniques discussed.

6. SAFETY CASE HISTORIES is a study of actual accidents that were caused by "human factors." After each case is presented, the film is stopped so the audience can discuss the accident causes, and remedies.

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Safety Talks for Construction and Maintenance Foremen	$1.50	$1.30	$1.25	$1.20
Construction Packets, each	1.90	1.55	1.45	1.35

	PURCHASE PRICE			PREVIEW AND RENTAL SERVICE (Shipped Prepaid-Return Prepaid)		
	Single Copy	2-9 Copies	10 or more	Day	Week	2nd Week
Human Factors in Safety, set of 6 films	$100.00	$95.00	$90.00		$7.50	(Preview Only)
Films 1 to 5, each	18.00	17.00	16.00	$3.00	5.00	$3.00
Film 6, each	30.00	29.00	28.00	3.00	5.00	3.00
Safety Management for Foremen, set of 10 films	100.00	95.00	90.00		$10.00	(Preview Only)
Films 7 to 16, each	12.00	11.50	11.00	$3.00	$5.00	$3.00

Preview and rental service is available only within continental limits of the United States.
Non-member prices are double member prices.

ORDER YOUR SET TODAY

SAFETY MANAGEMENT FOR FOREMEN

Safety Management For Foremen consists of 10 35 mm sound slidefilms with Leader's Manuals—everything needed for a 20 hour course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program, and how safety increases production. They also discuss specific safety activities such as machine guarding, safety inspections, the first aid program, etc.

7. FOLLOW THE LEADER gives a step-by-step description of how to organize a safety program. Ten components of a good program are discussed.

8. CAUSE AND CURE shows how to analyze an accident to determine its basic causes. Ten unsafe acts and eight unsafe conditions are illustrated.

9. GUARD DUTY pictures effective guards for common power machines, and points out that it's up to foremen to see that these guards are kept in place.

10. SAFETY IS IN ORDER is all about good housekeeping, from the foreman's angle. It shows how good order saves space, time, and material.

11. RIGHT DRESS pictures common types of personal protective equipment, and explains on what jobs each type should be used.

12. DOCTOR'S ORDERS discusses the importance of regular physical examinations, prompt first aid treatment, and reports on all first aid cases.

13. BRAIN BEATS BRAWN teaches foremen the best material handling practices, so that they, in turn, will know what to teach their workers.

14. STOP, LOOK AND LISTEN pictures a safety inspection committee at work—shows what to look for when making a plant inspection.

15. PRINCIPLES AND INTEREST demonstrates that selling safety is like selling anything else. Only when workers are interested, can you prevent accidents.

16. PRODUCTION WITH SAFETY proves conclusively that it takes less time to prevent accidents than to have them—that safety increases production.

• SAFETY TALKS FOR CONSTRUCTION AND MAINTENANCE FOREMEN

58 brand new safety talks for foremen, packed into a new 96-page booklet. These hard-hitting five-minute talks cover everything from why accident prevention to blasting operations. Written in the language of the foremen. A page of instruction tells your foremen how to use the talks—not as speeches to be read, but as sources of information. Gets down to details on how to conduct "tool box" meetings that pack a punch like a bulldozer. Written by members of the Executive Committee, Construction Section, National Safety Council. 8½" x 11".

CONSTRUCTION PACKETS

Each Construction Packet is a miniature library of safety information about a specific operation or type of equipment. For example, the "Ladders" Packet contains a safe practices pamphlet on ladders, a detail sheet showing how to build a safe ladder, several safety instruction cards, posters, and other supervisory aids. Packets available are:

First Aid	Chains and Hoisting Apparatus
Ladders	Concreting
Scaffolds	Welding
Clearing	Construction Equipment
Demolition	Steel Erection
Fiber and Wire Rope	Highway Construction
Excavation	Electric Line Construction

OCCUPATIONAL SAFETY SERVICES

EMPLOYEE *Training*

SAFETY CALENDAR FOR 1950

Each page of the 1950 calendar features a monthly theme of importance to plant safety programs. The illustrations, painted by leading artists, depict whimsical applications of the themes. For example, the January theme is "Use Your Safeguard." The back of the January page is filled with safety tips showing the worker and his family the value of using the safeguards provided at work, at home and in traffic. A high degree of readership is assured by monthly cash-prize contests. The 1950 safety calendar is an easy way to carry safety training into your workers' homes and remind them daily that safety pays.

SAFE WORKER

A pocket size monthly magazine that is one of the most popular of the Council's worker publications. Use this compact safety salesman to call on your workers every month. It sells safety painlessly with experience-tested tips on preventing accidents and eliminating unsafe practices. Cartoons, illustrations and humorous stories add chuckles to every page. SAFE WORKER has the light touch that gains worker interest and readership by talking in his own language about things important to him. Seasonal suggestions give timely hints on special hazards of the month. Two colors, 16 pages, size 3⅜" x 5⅞". Single issues may be purchased or subscriptions to 12 monthly issues.

SO HELP ME!

A sprightly new safety booklet designed to perk up interest in your safety program. It's packed with no-accident tips, clever cartoons and lilting safety jingles. Highlights tried-and-true safety rules; presented in an easy-to-read, convincing style.

SHOP SAFETY

A two-color booklet that teaches safety with many pictures and few words. Contains 56 photographs, 50 hand-drawn illustrations and a number of cartoons. It covers use and care of hand tools; lifting, handling, and piling material; precaution to use around machinery — making adjustments, oiling, guarding, proper dress, etc.; good housekeeping; preventing fires; avoiding falls; protective equipment; and first aid. Size 5¼" x 8½", 32 pages, durable cover.

I JUST GAVE MY SEAT TO A LADY

Hilarious collection of safety cartoons — Walt Ditzen's best. 120 pages of humor that capitalizes on the light approach to safety training. It makes a fine souvenir at safety dinners or plant safety rallies. Your workers will enjoy it for months to come.

DON'T TOUCH THAT WIRE

Dangers of touching fallen wires. What to do when finding someone in contact with live wire. Stresses just as easy to be careful as it is to be careless. Leaflet 3½" x 8".

CALENDAR PRICES

F.O.B. CHICAGO Quantity	MEMBER Packed Flat In Bulk	MEMBER In Mailing Tubes	NON-MEMBER Packed Flat In Bulk	NON-MEMBER In Mailing Tubes
*1 to 9	50c ea.	55c ea.	60c ea.	65c ea.
10 to 199	48c ea.	51c ea.	55c ea.	58c ea.
200 to 999	40c ea.	43c ea.	45c ea.	48c ea.
1,000 to 9,999	36c ea.	39c ea.	39c ea.	42c ea.
10,000 or more	33c ea.	36c ea.	36c ea.	39c ea.

* No charge made for mailing tube on orders for single copies. Write for sample copy and details of ordering.

PHOTOSCRIPTS

A new series of booklets that teach safety with pictures. Illustrated with actual on-the-job scenes that are realistic and convincing. A training aid that gets attention — brings results. Samples on request.

MACHINISTS HAND TOOLS
Presents four easily-followed rules for eliminating hand tool accidents: 1. The right tool; 2. In good condition; 3. Used correctly; 4. Kept in a safe place.

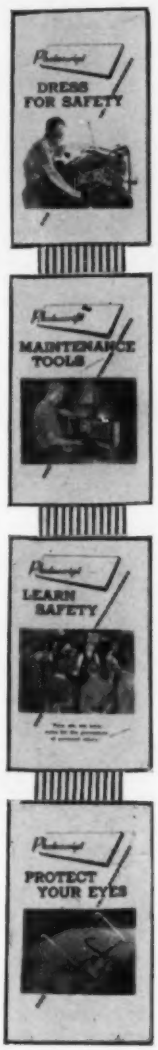
A CLEAN PLANT
A clean plant is safer, more efficient, a better place to work. This photoscript points out that plant housekeeping is the responsibility of each worker.

PREVENT FIRE
Pictures common fire causes—how they can be spotted and eliminated. Stresses importance of knowing where emergency fire equipment is and how to use it.

GET FIRST AID
Stresses the importance of immediate first aid for ALL injuries. Tells workers that a minor scratch — untreated — can result in a crippling injury; never take a chance.

DRESS FOR SAFETY
Stresses clothing that fits you and your job, and the need for special protection on special jobs. Covers goggles, hard hats, safety shoes, gloves, etc.

LEARN SAFETY
Presents the ten basic rules for the prevention of personal injury. Discusses unnecessary chances, horseplay, handling material safely, first aid, safe clothing, good housekeeping, etc.



NO LAUGHING MATTER
Falls rank second only to automobile accidents as a cause of accidental death. This photoscript pictures ten safety rules for avoiding falls; eliminating fall hazards.

SAFE HANDLING OF MATERIALS
Presents practical tips on lifting, carrying, and piling. Stresses importance of wearing gloves and protective foot gear when lifting. Must reading for all workers.

CONSTRUCTION EQUIPMENT SAFETY
Teaches workers to know and recognize standard signals for operation of cranes. Illustrates safe practices to observe in working with cranes, bulldozers, and dump-trucks.

MEN AND MOTIVE POWER
Safety know-how for railroad shop and roundhouse workers. Shows safe use of scaffolds, wrenches, hammers and sledges, compressed air. Safety rules for machine operators.

MAINTENANCE TOOLS
Drives home the A B C's of handling tools: choose the right tool; keep it in good condition; use it correctly; and keep it in a safe place.

PROTECT YOUR EYES
Illustrates the two good reasons for wearing safety glasses — both your eyes. Gives the prescription for eye safety; wear the right glasses, make sure they fit, and keep them clean.

• FIRST AID REMINDERS
For either general first aid instruction or quick reference in case of an emergency. Excellent for pay roll enclosure, information racks, employee handouts. Very effective when used in conjunction with plant first aid meeting. Series of 7 four-page leaflets in attractive colors, size 3½" x 6¼". Titles are Artificial Respiration, Sunstroke and Fainting, Bleeding, Burns and Poisons, Broken Bones, Sprains and Bruises, How to Move an Injured Person.

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Safe Worker, subscriptions	$0.65	$0.60	$0.45	$0.38*
single issues, each	.065	.06	.045	.033
*5,000 to 9,999 each, $0.36 per year; 10,000 to 19,999, each $0.34 per year; 20,000 or more, each $0.32 per year.				
Shop Safety, each	.25	.20	.15	.14
So Help Me! each	.15	.075	.06	.045
I Just Gave My Seat to a Lady, each	.25	.20	.18	.16
Photoscripts, any selection, each	.10	.06	.05	.04
First Aid Reminders, sets	.25	.18	.12	.09
any selection, each	.06	.045	.03	.023
Don't Touch That Wire	.05	.025	.02	.015

Non-member prices are double member prices.

• PASS OUT PHOTOSCRIPTS AFTER SAFETY MEETINGS

OCCUPATIONAL SAFETY SERVICES

EMPLOYEE *Training*

DECALCOMANIAS

SAFETY DECALS

S- 1—Sound Warning at Corners and Aisle Crossings
S- 2—Keep This Machine in Safe Condition
S- 3—Do Not Talk To or Distract Operator
S- 4—Before Starting Be Sure Everyone Is In the Clear
S- 5—No Riders
S- 6—Keep Tools in Safe Condition and in Proper Place After Use
S- 7—Keep Floor Clean Around This Machine
S- 8—First Aid Kit
S- 9—Only Authorized Persons May Change Fuses or Make Repairs
S-10—Keep This Space Clear
S-11—Deposit Waste Material Here
S-12—Deposit Waste Here
S-13—Avoid Falls. Walk — Do Not Run — Use the Handrail
S-14—Please Keep Your Locker Clean
S-15—All Injuries Must Be Reported Promptly

CAUTION DECALS

C- 1—Shut Off Machine When Not in Use
C- 2—Fire Door—Do Not Block
C- 3—Shut Off Engine Before Refueling
C- 4—To Be Operated Only by Authorized Employees
C- 5—Pull and Lock Switch Before Oiling, Adjusting or Repairing Machine
C- 6—Use Brush to Remove Chips
C- 7—Stop Machine Before Making Adjustments
C- 8—Use Fuse Puller to Remove Fuses
C- 9—Do Not Operate Without Guards
C-10—Keep Guards in Correct Adjustment
C-11—Replace Guard Before Using Machine
C-12—Wear Your Respirator
C-13—Ground Equipment Before Use
C-14—Do Not Use Near Electrical Equipment
C-15—Wear Safety Cap While Operating This Machine
C-16—Keep Closed

GREEN CROSS MEMBER—N.S.C. Decal

Available Only to Members NSC.

NO-ACCIDENT AWARD PINS

This handsome screw-post pin is the ideal recognition for workers who exert extra effort to work safely. Featuring the Green Cross in green enamel, each pin shows the exact number of accident-free years. 1 to 4 year pin—bronze; 5 to 9 year pin—silver plate; 10 to 40 year pin—gold plate. May not be used as driver awards.

DSS FLAGS

(Distinguished Safety for Service.) Available to those winning DSS Awards. 4 x8½'.

GREEN CROSS FLAG

Green Cross emblem on white field. Use it for contests or general inspirational effect. Drop it to half-staff when there is a lost-time accident. 4'x6'. Flame-proofed upon request. $0.30 extra. Same price to non-members.

Safety decals attached to machine frames, guards, fuse boxes, and fire doors constantly remind workers to observe safe practices; follow specific instructions. These full-color decals conform to ASA specifications. Order by letter and number. Available only in size 2"x3½".

FIRE DECALS

F-1—For Wood, Paper, Textiles and Rubbish (Class A Fires) Not Electrical Equipment
F-2—For Wood, Paper, Rubbish and Burning Liquids (Class A & B Fires) Not Electrical Equipment
F-3—For Burning Liquids (Gasoline, Oil and Paint and Electrical Equipment) (Class B & C Fires)
F-4—Sprinkler Valve—Do Not Close Unless Authorized

DANGER DECALS

D- 1—Do Not Wear Gloves While Operating This Machine
D- 2—High Voltage
D- 3—Keep Out of Direct Line of the Saw
D- 4—Keep This Guard in Place
D- 5—For Emergency Use Only
D- 6—Wear Goggles While Operating This Machine
D- 7—Flammable—Keep Flames and Heat Away
D- 8—Corrosive Liquids — Use Personal Protective Equipment
D- 9—220 Volts
D-10—440 Volts
D-11—Moving Parts—Keep Clear
D-12—No Smoking
D-13—Wear Goggles in This Area
D-14—Oxygen—Keep Oil and Grease Away
D-15—Acid
D-16—Caustic

GREEN CROSS ELECTROS

An electrotype of the Green Cross emblem suitable for use on letterheads, booklets, and in advertising. The Green Cross for Safety emblem may not be used directly or by implication to endorse or approve a commercial product. Members may use the words: "Member National Safety Council," in conjunction with this copyrighted emblem. Mats and proofs of the emblem in ½", 1" and 2" sizes free. Same price to non-members.

SAFETY CONTEST TROPHY

An attractive award plaque to reward the best safety record in interdepartment or interplant contests. 6"x7½" solid bronze casting on an 8"x10½" walnut board. Ample space for engraving inscription.

- *INTEREST AROUSERS*
- *ATTITUDE MOLDERS*
- *CONTINUOUS AND ONE SHOT MATERIALS TO PUT PUNCH INTO YOUR OFF-THE-JOB TRAINING*

SAFE RAILROADER

Bi-monthly pocketsize magazine for railroad workers. This clever safety salesman makes liberal use of cartoons and humorous stories to win the employee's interest. 3⅜"x6". Annual subscription (6 issues).

GREEN CROSS PINS

Satin-finish silver-plated lapel pin featuring the Green Cross for Safety emblem in contrasting green enamel. Popular screw-post design. Same price to non-members.

IN THE PINK

A Ditzen cartoon-illustrated booklet presenting the fundamental rules for good health, but with a fresh, approach. Covers such subjects as: posture, sleep, eye and foot care, weight, cleanliness, and first aid. 16 pages, 2 colors.

SAFE 'N' SOUND

Set of 12 office and off-the-job 4 page safety leaflets. Include one each month in the worker's pay envelope. Size 3½"x6¼"

SAFETY REGISTER

Colorful booklet prepared for restaurant and hotel workers. Illustrates frequent causes of accidents; how to avoid them. Cartoon illustrated, 2 colors, 16 pages, 3"x5½".

BROKEN GLASS CARD

Red and white warning card to be dropped on floor to indicate presence of broken glass. Printed on both sides, 2"x6".

SEVEN STEPS TO SAFETY

Tells hotel patrons how to protect themselves in case of emergency. Place under glass table tops, on doors or walls. 5"x7½".

SAFE AT HOME

A gay, informative booklet packed with suggestions for eliminating accident hazards from the worker's home. Room by room, it illustrates the ideal arrangement from the safety angle. Printed in two colors, liberally illustrated, 16 pages, size 4"x7½".

WHEN YOU BUILD OR REMODEL

A 16-page informative booklet on how to prevent accidents through the design and construction of safer homes. Covers how to ground electrical appliances; temperature and pressure controls; placement of gas meters; safe stairway design; good building practices; and many other vital points of interest to every home owner.

HOLD EVERYTHING

A colorful off-the-job booklet dealing with accidents in the home, on the street, at play, on summer vacations. Includes an interesting self-test for checking hazards in the worker's home. Printed in red and blue, 16 illustrated pages, size 4"x7". Non-member prices same as member.

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Decalcomanias, any selection, each	$00.10	$00.06	$00.05	$00.04
No-Accident Award Pins				
Bronze (1 to 4 yrs.)	.30	.25	.18	.16
Silver plated (5 to 9 yrs.)	.32*	.27*	.20*	.18*
Gold plated (10 to 40 yrs.)	.34*	.29*	.22*	.20*
DSS Flags, each	22.00	20.00	20.00	20.00
Green Cross Electros, each				
½", ⅝"	.65	.60	.60	.60
¾", 1"	1.20	1.05	1.05	1.05
1½"	1.80	1.65	1.65	1.65
Safety Contest Trophy	25.00	23.00	22.00	22.00
Green Cross Pins, each	.40*	.30*	.25*	.20*
Safe Railroader, subscription (6 issues)	.40	.35	.26	.23†
single issues billing	.08	.07	.052	.046
†5,000 to 9,999 each $0.22 per year; 10,0000 to 19,999, each $0.21 per year 20,000 or more, each $0.20 per year. Single issues or subscriptions on monthly billing; 1/5 annual rate.				
Safe 'N' Sound, sets of 12	.50	.40	.35	.30
Single copies	.05	.04	.035	.03
Safety Register, each	.15	.09	.08	.06
Broken Glass Cards, each	.05	.017	.014	.012
Seven Steps to Safety, each	.05	.03	.025	.02
Hold Everything, each	.12	.10	.07	.055
When You Build or Remodel, each	.15	.10	.09	.08
Safe At Home, each	.15	.075	.06	.045
In The Pink, each	.15	.075	.06	.045‡
‡10,000 or more, each $0.04				
Green Cross Flag, each	8.50	8.00	7.50	7.50

* Plus 20% Federal Excise Tax.

Non-member prices are double member prices unless otherwise stated.

OCCUPATIONAL SAFETY SERVICES

EMPLOYEE Training

SAFETYGRAPHS

Safetygraphs are visual aids for training small groups. They are illustrated safety talks, ready for use at a moment's notice. They are complete within themselves, need no time-consuming preparation or costly equipment.

A complete safetygraph consists of from 12 to 16 spiral-bound pages, inserted in a brown, leatherette portfolio. Set the safetygraph on any flat surface, open the portfolio cover, and PRESTO—you have an easel. Your safety talk is printed on the back pages in large, easy-to-read type. And on the front pages, facing your audience, are colorful cartoons and duotone photographs that highlight your talk and drive home your statements.

There are 15 safetygraphs now available. Use them in your own plant, to make your safety training job easier and more effective. You'll find that superintendents, foremen, training supervisors—even workers inexperienced in safety—can give a smooth, informative safety talk with a safetygraph as a helper.

No. 1, HOW TO LIFT, teaches your workers efficient and safe procedures for lifting, handling, and carrying materials. The rules stressed are: keep hands in the clear; get a good grip; have a good footing; bend your knees; keep the load close to you; get help for heavy or awkward loads. The safetygraph gives specific instructions for handling long loads, drums, heavy boxes, and bags.

No. 2, BENCH AND STAND GRINDERS, discusses and illustrates: eye protection around grinders; proper spacing for work rests; the right work pressure; preventing exploding wheels; avoiding overheating; checking wheels for damage; checking speed ratings when changing wheels; ring-testing wheels for defects; proper washers; protective hood adjustments; dressing wheels; preventing excessive vibration.

No. 3, OPERATING A POWER PRESS, particularly emphasizes guarding—what types of guards are common, and why it is to the operator's advantage to use them. Also discussed are: use of sticks to remove pieces that are caught; special tools to insert and remove work; what to do when fatigued or interrupted; preventing damage to dies; signs of trouble; proper dress; handling stock parts, and scrap.

No. 4, WEARING GOGGLES, is a head-long attack on complaints about wearing safety goggles. It shoots holes in time-worn excuses like: "they're too heavy" . . . "they get dirty" . . . "the lenses fog up" . . . "they give me a headache" . . . "this job'll only take a minute." With humor and logic, it wins over non-believers and reconverts backsliders who have been careless about wearing goggles.

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Safetygraphs, complete each	$13.25	$12.50	$12.00	$12.00
Easels only, each	3.25	3.00	3.00	3.00
Safetygraphs only, each	10.00	9.50	9.00	9.00

Members may order Safetygraphs on 5-day approval.
Non-member prices are double member prices.

No. 5, PLANT HOUSEKEEPING, stresses that it's up to each worker to wipe up grease, put scrap in a box, keep the work place clear, and keep lockers clean. It also discusses the safe way to stack materials: start the foundation right; keep the pile straight; cross-tie layers; step-back upper rows of tall piles; keep aisles and fire exits clear, etc.

No. 6, LADDER SAFETY, teaches the four primary rules of ladder safety: 1. Select the right ladder—neither too long nor too short; 2. Inspect it before use—look for structural weakness or faulty repairs; 3. Secure it—place at proper angle, use non-slip feet, lash if necessary; 4. Use properly—climb up and down the safe way, secure tools so they won't drop.

No. 7, USING FIRE EXTINGUISHERS, explains the different classes of fire, what type of extinguisher to use for each, and how to use it. It also discusses exactly what to do in case of fire. The safetygraph is most effective when used as Part I of a two-part course. Part 2 should be outdoor demonstrations where extinguishers are used to put out actual fires.

No. 8, ACCIDENTS DON'T HAPPEN, gets right down to the grass root of safety—to the basic principle that accidents don't happen, they are caused. It discusses unsafe conditions and unsafe acts, cites specific instances of each type, and clearly shows how each accident could have been prevented. The safetygraph is not only a teaching aid; it also sells your workers on your safety program.

No. 9, COMMON HAND TOOLS, shows your workers how to avoid hand and finger injuries caused by hammers, wrenches, chisels, knives, files, and screw drivers. The four ways to prevent hand tool accidents are: use the right tool for the job; use a tool in good condition; use it in the right way; keep tools in a safe place. The safetygraph shows how these rules apply to each common hand tool.

No. 10, PREVENTING FIRE, explains what fire is, and how it can be prevented by controlling two of the three fire components—heat and fuel. It discusses the major sources of heat in industrial fires — electricity, matches, and smoking, and also the types of fuel involved in most industrial fires — oil spills, oily or greasy rages and clothing, flammable liquids and vapors, etc.

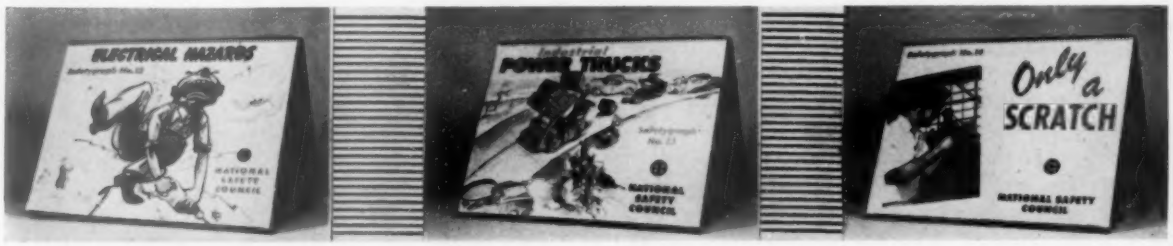
No. 11, TOE PROTECTION, is a persuasive presentation of the facts about safety shoes. It examines all the common objections to wearing safety shoes—"They hurt my feet" . . . "they're cold" . . . "I don't like them" —and proves that each is based on unfounded prejudice or lack of information. It also shows some off-the-job uses for safety shoes.

No. 12, ELECTRICAL HAZARDS, sums up the four most important points to remember about electricity and electrical equipment. 1. Use good equipment. 2. Don't overload circuits. 3. Keep away from live conductors. 4. Ground an electrical tool before use. Discusses and illustrates the common causes of electrical burns and injuries. ELECTRICAL HAZARDS pays for itself in a short time by showing workers how they can prolong the life of electrical devices, and avoid cord damage, insulation failure, etc.

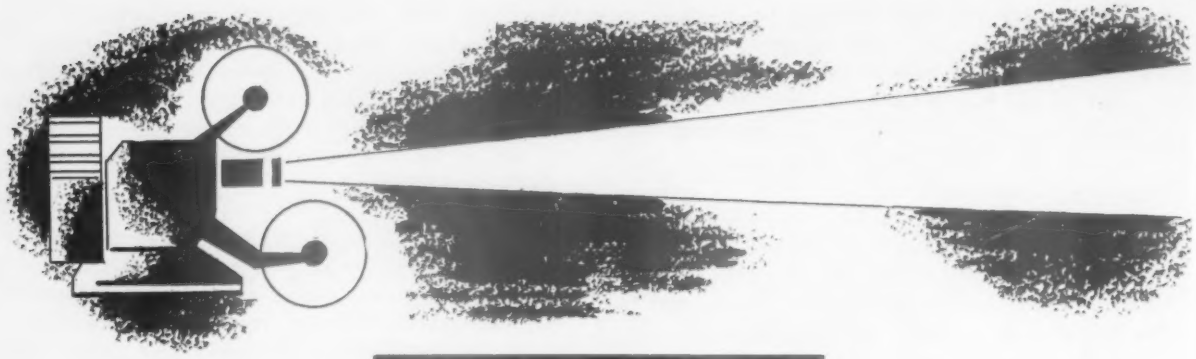
No. 13, INDUSTRIAL POWER TRUCKS, gets down to actual cases of what causes plant truck accidents. Discusses parking, loading, inspecting truck daily, and safe driving practices. Illustrates some of the wrong ways to use a truck. Covers operating in close quarters, and the safe way to approach and enter an elevator, etc. Drives home the idea that too much speed, inattention, violations of driving rules and improper attitudes are the main causes of plant truck accidents. Reach every driver with this easy-to-use, effective, driver training aid.

No. 14, ONLY A SCRATCH, goes to work on an important safety problem — how to get workers to use first-aid on little injuries. Shows how to treat different types of wounds such as punctures, lacerations, and incisions. Sells your workers on the idea that protecting themselves against infection isn't a sign of weakness, it's good sense. Particularly emphasizes that good physical condition doesn't always mean good resistance to germs.

No. 15, WANTED—SAFE WORKERS, an informal session on what makes a safe worker. Deals with the worker who understands his job and does it well, and with the fellow who learns the hard way. Covers, with a story style, how to act at work, and dress at work. Includes horseplay and crazy stunts, right kind of clothes, personal protective equipment, first aid, good housekeeping. Stresses cooperation between fellow workers. Sums up by pointing out that safety is a necessary part of our lives if we are going to do all the things we've planned.



OCCUPATIONAL SAFETY SERVICES



SAFETY FILMS

35 mm SOUND SLIDEFILMS

Council sound slidefilms consist of a 35 mm filmstrip and a 33⅓ RPM recording. Film titles having asterisks have Conference Leader's Manuals (discussion outline and quiz). One copy is furnished with each film purchased.

Filmstrip or record replacements for Sound slidefilms may be purchased at $3.50 each, provided the damaged part is returned with the order. Otherwise, cost of either replacement is ½ the price listed for the complete film. Films will be sent on approval. Preview service charge is applied against the purchase price if the film is retained.

WORKER TRAINING COURSE

A group of ten sound slidefilms designed to give workers a well-rounded basic course in safety. Each slidefilm and record in this series has been prepared specifically as an industrial training tool. The Leader's Manuals contain instructions for holding 10 stimulating safety meetings, quizzes on the subject matter of each film, and discussion outlines. Everything is planned, even an exact time schedule for the meetings. Set includes leatherette-bound carrying case.

17.* Learn and Live Presents the 10 basic rules of industrial safety. This film lifts these rules from your company rule book; brings them to life with action shots showing how and why they are applied—what happens when they are ignored. 15 minutes.

18.* Safe Handling of Materials One-fourth of all industrial accidents involve handling of materials. Film shows how foremen can give effective instructions on how to lift and carry, how to avoid sprains, strains, hernias, mashed fingers and toes. 15 minutes.

19.* No Laughing Matter Typical plant scene showing group of safety people discussing falls; how they can be prevented. Group starts off with a discussion of falls involving vehicles; proceeds to ladders and scaffolds. Winds up with miscellaneous fall hazards.

20.* Safe in Hand Consists of two filmstrips—Part 1, Machinists' Tools and Part 2, Maintenance Tools; a two-sided record. Part 1, illustrates safe practices in use of hammers, chisels, wrenches, pliers, screwdrivers; Part 2—saws, axes, pinch bars, crow bars, and jacks.

21.* Keep It Clean Puts across the idea that any plant can be kept clean if everyone pitches in. Shows before-and-after pictures of housekeeping conditions; how to interest workers in keeping the plant clean; the trouble spots that need special attention. 15 min.

22.* Fifteen Minutes to Go Dramatizes the extreme risk involved in delaying or neglecting first aid for all injuries. Convinces workers that it's smart to get first aid immediately—for even the tiniest hand or finger cut, harmless-appearing burns. 15 minutes.

23.* The Fire Thief Fire—the thief of lives and property—is given a good going-over in this film. Discusses the fire hazards of flammable liquids, faulty insulation, makeshift wiring, short circuits, overfusing, hot slag, dust, sparks; prevention techniques.

85. What's Your Safety I.Q.? Film on off-the-job safety. Intended for employee use but may be used by any group. Quiz pictures showing a number of "what's wrong with the picture." Deals with safety at home, traffic and recreation. Audience participates in solving quizzes. Also available in sound motion.

25. My Eye Deal Colored, cartoon film that combines giggles with goggles. Tells the story of Herkimer, and how he learned the value of wearing safety goggles. It's a story with a moral that workers don't soon forget. Running time, 10 minutes.

8.* Cause and Cure Points out that too many foremen pass the buck to their workers when they have to report on an accident. Shows that accidents have definite causes—and cures. Illustrates unsafe acts and conditions that foremen should look for.

26.* Construction Equipment Safety A dozen unsafe acts cause three out of four accidents with construction equipment. Film illustrates these mistakes; tells the safety rules all workers should observe.

84. Easy on the Eyes Makes your workers eye-protection-wise. Shows the various types of glasses for specific jobs and stresses three rules; proper fitting, wear the correct protection, keep them clean. Also available in sound motion.

27.* Giant Hands of Indsutry Points out that the two main causes of crane accidents are failure to use correct hand signals, and failure to keep in the clear. Illustrates standard hand signals and safety tips.

28.* Keep 'Em Rolling Special railroad film in which a car foreman and a railroad safety officer tell about the precautions every car man must take to protect himself and others from injury. 15 minutes.

29.* Laboratory Glassware The majority of laboratory accidents are caused by improper or careless handling of glass equipment. This film shows the precautions to observe in handling glass. 10 minutes.

30. Men of Maintenance A know-how film for railroad maintenance men. Illustrates the precautions to be observed in operating motor track car, on all types of maintenance equipment, on or near third rail.

31. Minute Men Dramatizes the hazards involved in the work of utility company linemen—the safety precautions they must observe. Also safety rules for boiler room, substation, meter department workers.

32.* Sawmill Safety A safety tour through a sawmill — illustrating safety precautions from the pond through all operations to the piling machine. Also first aid, housekeeping, and protective equipment.

33.* Timber Presents a session of a logging company's safety committee. Topics discussed: walking on log; fall hazards; avoiding injuries from axes and saws, widow makers, line and gear, and other common hazards.

34.* Woodworking Machines Gus, an old, safety-wise woodworker, takes two new safety committee recruits through the shop. Emphasizes the value of machine guards on saws, splitters, jointers, shapers, and planers.

35.* Woven with Safety Discusses major causes of accidents in textile mills: improper material handling, machinery hazards, compressed air, knives, scissors. Stresses importance of first aid. 15 minutes.

36.* Packed with Safety A film produced specifically for the meat packing industry. Stresses the importance of using caution in working with knives. Also discusses protective equipment, first aid, lifting.

37. Safely We Work Railroad film. Shows how to get on and off a moving car, how to climb tank ladders. Discusses hand, power, and air brakes; walking between and across tracks, coupling and cutting cars.

38.* You and Your Tractor Explains the safe operation of the following industrial power trucks; ram-type, fork, carrier, tow, dump, crane, flat top, wiggle tail, and scoop. Also proper loading and maintenance.

39.* Safe Haulage in Coal Mines Pictures are based on actual accident experience. Discusses maintenance hazards of motors and cars. Silent film.

40.* Jackhammer Safety (Silent filmstrip.) Emphasizes importance of protective equipment, keeping jackhammer in good condition. Illustrates standard safe practices in drilling and blasting. 15 minutes.

41.* Blasting Safely in Mines Demonstrates the "know how" and skill of using explosives safely. Also discusses storage of explosives. Silent film.

42.* Men and Motive Power Dramatizes the precautions to observe in railroad roundhouse and shop work. Discusses falls—how they can be eliminated. Shows correct use of tools, importance of protective equipment.

43. Invisible Red Ink An appeal to business management to recognize the importance of a planned safety program, not only for humanitarian reasons, but from an actual dollars and cents standpoint. 20 min.

MEMBER PRICES	PURCHASE PRICE			PREVIEW AND RENTAL SERVICE (Shipped Prepaid-Return Prepaid)		
	Single Copy	2-9 Copies	10 or more	Day	Week	2nd Week
Set, films No. 17 to 23, 25 and 8, and 85	$160.00	$155.00	$150.00		$10.00 (Preview Only)	
Films No. 17 to23, 26 to 35, 84 and 85, each	18.00	17.00	16.00	$3.00	5.00	$3.00
Film No. 8, each	12.00	11.50	11.00	3.00	5.00	3.00
Film No. 25, each	24.00	23.00	22.00	3.00	5.00	3.00
Films No. 36 to 38, each	7.00	6.50	6.00		1.00 (Preview Only)	
Films No. 39 to 41, each	10.00	9.50	9.00	2.00	4.00	2.00
Film No. 42, each	35.00	30.00	25.00	6.00	10.00	6.00
Film No. 43	7.00	6.50	6.00	Free Loan (User pays Shpg. Charges)		

Additional copies of Leader's Manuals are $0.15 each. Additional copies of the Human Factor Manual are $0.50 each.
Non-member prices are double member prices.
Preview and rental service is available only within continental limits of the United States.

● *See Service Guide 6.2 for more complete description of all sound slidefilms.*

EMPLOYEE *Training*

INDUSTRIAL (continued)

83.* Building Construction Safety This film is aimed directly at the old superstition that each story of a building is paid for with the life of a worker. Covers demolition and remodeling, steel scaffolding, ladders, unguarded floor openings, concrete placement, material hoists, housekeeping, etc. Points out the difference between expensive and dangerous operations, and fast and efficient ones. Silent.

PUBLIC SAFETY

44. For You and Yours Narrated by Vincent Pelletier, features Edw. G. Robinson and Dinning Sisters. Tells what can be done to prevent accidents.

45. Are Your Feet Killing You? Hits hard at the causes of pedestrian accidents. Illustrated with actual case histories of pedestrian accidents.

46.* It's Your Home—Plan It Safely Shows how to build safety into the home. Discusses stairs, kitchens, closets, plumbing, heating, and electricity.

47. Mary Jones Goes to Court Shows how the Police Department, through engineering, education, and enforcement, try to prevent accidents. 20 minutes.

48. No Use Skidding Film that dramatizes the hazards of winter driving — how to avoid them. Discusses braking on snow and glare ice, other driving tips.

49. On Record Most states require a written report of any accident involving an injury or damage over $25.00. Shows procedure for preparing, filing—how used.

50. Traffic Jam Ahead Illustrates intensified traffic hazards. Outlines program for traffic safety.

51. Testing the Drinking Power A dramatic story of scientific tests used in drunk driving cases.

SAFETY FILMS

35mm SOUND SLIDEFILMS *(continued)*

52. SIGNS OF LIFE Narrated by Eddie Cantor, the film deals with all the signs and signals to be found along the highway and in city traffic. Learning to recognize those signs and signals by their shape is stressed.

FILMS FOR SUPERVISORS

Sixteen films for foremen and supervisors are described on pages 14 and 15.

THEATRE TRAILERS

Write in for description of 16 and 35 mm sound motion pictures on traffic and home safety, suitable for theatres, schools, etc. One minute running time.

MOTOR TRANSPORTATION

Eight Films are described on page 35.

● Films will be offered in a new form not available at present, except in the 35 mm "What's Your Safety I.Q.?" This sound slidefilm has a recording on each side of the record. One uses an audible signal for advancing the film as is presently being done, while the other uses an inaudible signal which advances the film automatically. This is known as the 30-50, low frequency signal. Special Projectors are needed to operate by this method. There is no increase in price for this. At a later date, additional films will be added using this new form.

MEMBER PRICES	PURCHASE PRICE			PREVIEW AND RENTAL SERVICE (Shipped Prepaid—Return Prepaid)		
	Single Copy	2-9 Copies	10 or more	Day	Week	2nd Week
Film No. 44, each	$ 7.00	$ 6.50	$ 6.00	Free Loan (User pays shpg. charges)		
Films No. 45 to 51, each	9.00	8.50	8.00	Free Loan (User pays shpg. charges)		
Film No. 52, each	4.50	4.50	4.50	Free Loan (User pays shpg. charges)		
Film No. 57, each	52.50	50.00	47.00	$3.00	$5.00	$3.00
Films No. 58 to 63, 68 to 81		Rental Only		3.00	5.00	3.00
Film No. 82, each	30.00	29.00	28.00	3.00	5.00	3.00
Film No. 83, each	10.00	9.50	9.00	2.00	4.00	2.00
Films No. 86 and 87, each	45.00	42.50	40.00	3.00	5.00	3.00

Non-member prices double except on Films No. 44 to 52 and 68 to 82.
Preview and rental service is available only within continental limits of the United States.

● **DRAMATIZE YOUR TRAINING PROGRAM WITH FILMS**

16mm SOUND • MOTION PICTURES

INDUSTRIAL

57.* **For Safety's Sake** shows how to use, inspect, and care for portable power tools — specifically drills, grinders, saws, and electrical tools.

58. **Burning—The Safe Way** discusses the safeguards every burner should take; proper dress; safe work methods; use of safety equipment provided.

59. **Eye Accidents** illustrates methods of eye protection for workers engaged in underground mining. SILENT. Running time, 15 minutes.

60. **Stop Silicosis** illustrates the danger of silicosis and dust hazards in industrial plants, and explains how to eliminate these hazards.

61. **The Safety Sleuth** is an M-G-M Pete Smith short showing how accidents occur, and how the causes be ferreted out and remedied by an alert safety engineer.

62. **Welding—The Safe Way** is an industrial training film that discusses and illustrates safe working methods for welding operations. Running time, 18 minutes.

63. **Care and Use of Hand Tools** Six motion pictures illustrating the safe use and care of hand tools. Shows generally accepted rules for handling specific tools with complete safety. Can be effectively used for employee training.

A. Wrenches—20 minutes
B. Pliers and Screwdrivers—17½ minutes
C. Chisels—12 minutes
D. Hammers—11 minutes
E. Punches, Drifts and Bars—14 minutes
F. Hack Saws—18 minutes

86. **Easy on the Eyes** Same subject matter as film No. 84, but employs a new technique in visual education. Combines motion with still pictures and special optical effects to give motion sequences.

87. **What's Your Safety I Q?** Same subject matter as film No. 85 combines motion with still pictures and special optical effects to give motion sequences.

PUBLIC SAFETY

82. **Home Safe Home** How every member of the family can help to eliminate home hazards and avert tragedy.

68. **Traffic with the Devil** is an M-G-M film, originally prepared for theatrical distribution. It presents the dangers of motor traffic today. Running time, 17 minutes.

69. **Miracle in Paradise Valley** is designed to inspire participation in farm safety programs. Running time, 30 minutes.

70. **Diagnosis Danger** Inaugurating a comprehensive safety program in a hospital.

71. **Highway Mania** is a documentary picture on traffic accidents, and the toll of life and limb they take.

72. **1-2-3-Go!** is an M-G-M "Our Gang" comedy. The "Gang" safety society lays down three primary rules for safely crossing streets. Running time, 10 minutes.

73. **Men at the Wheel** is a "March of Time" film. It singles out for special condemnation the driver who is always taking a chance. Running time, 12 minutes.

74. **Safety in the Home** covers many hazards existing in the home. Uses negative instruction technique.

75. **Screwdrivers and Screwjays** features Lew Lahr, movie comedian, playing the part of a screwy driver, and Don Wilson, radio announcer, as a screwy jaywalker.

76. **Teach Them to Drive** Urgent message to teach young people to drive. Shows driver training methods.

77. **The Seventh Column** is an M-G-M Pete Smith short. It shows how carelessness is the cause of many unnecessary accidents in the home, factory, and on streets.

78. **The Chance to Lose** illustrates the tremendous chances taken by many drivers, and compares this chance-taking with various forms of gambling.

79. **What Price Happiness** discusses and illustrates the common causes of home accidents, and then explains how these accidents may be prevented.

80. **X Marks the Spot** is a story relating the traffic experiences of a somewhat whimsical—though typical—driver and pedestrian. Running time, 20 minutes.

81. **You Bet Your Life** Deals with necessity for observing signs, signals, and pavement markings and with school buses on the highway; also shows standard arm signals. 11 minutes.

EMPLOYEE Training

SAFETY POSTERS

Posters, with their colorful pictures and punchy captions, are the mass advertising and selling medium for your safety program.

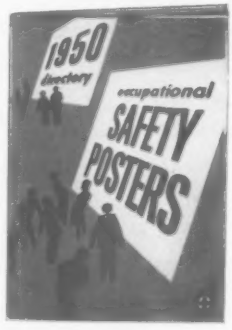
The Council maintains a stock of approximately 1000 different posters covering all phases of safety and health.

The DIRECTORY OF OCCUPATIONAL SAFETY POSTERS illustrates hundreds of posters in miniature, classified and indexed for easy reference. New posters produced during the year are shown in the NATIONAL SAFETY NEWS. Highly specialized posters for a particular industry are announced in the news letter of the Section concerned, but often are not shown in the NEWS because of their limited application. All posters shown in the Directory and the NEWS will be available throughout the year.

Non-member price same as members.

Posters are produced in four sizes: "A" size, 8½" x 11½"; "B" size, 17" x 23"; "C" size, 25" x 38". One "C" size poster is produced each month, and is shown in the NATIONAL SAFETY NEWS.

Those who do not wish to select their own posters may have them selected by Council staff engineers, and shipped automatically each month. Staff engineers make selections each month to provide specialized automatic poster service for 56 different types of operations. See the Directory of Occupational Safety Posters for a complete explanation of automatic poster service, or write the Council for additional information.



SAFETY POSTERS CAN BE YOUR MOST POTENT SALES TOOL.

POSTER ELECTROS

You may obtain electrotypes of any poster illustrated in black and white in the directory or in the poster section of NATIONAL SAFETY NEWS. (Electrotypes of 3 and 4 color posters are not available.) Electrotypes are approximately 1⅞" x 2¾", suitable for use in plant publications and leaflets. Order by poster number.

POSTER FRAMES

Black enameled metal frames, made to fit National Safety Council posters. Especially useful when display boards are not available, or to spot a single poster at at strategic point. Frames are large enough to accommodate cardboard backing and also a glass or plastic sheet in front of the poster.

JUMBO POSTERS

Jumbo posters, placed at your plant entrance or at other vantage points, make an impressive safety display that can't be missed. Council artists design these posters to be read at a glance and remembered a long time.

These eye-catching displays measure 11 feet 8 inches wide by 9 feet 11 inches high, are weather-proofed, and come in eight sections for easy mounting. Three-color illustrations feature safety messages of a general nature which are appropriate for all phases of operations and all types of readers.

The National Safety Council produces 12 different Jumbo posters each year. They are available on an annual subscription basis, a poster being delivered each month in time for posting on the first of the following month. Only the current month's poster can be shipped; back issues are not stocked. See Service Guide 5.1-1 or write the Council for further information.

"C" SIZE POSTERS

The newest addition to the Council's poster service is the (25" x 38") "C" poster. One of these large indoor posters is produced each month. They are printed in two colors, and carry general safety messages applicable to any industrial audience.

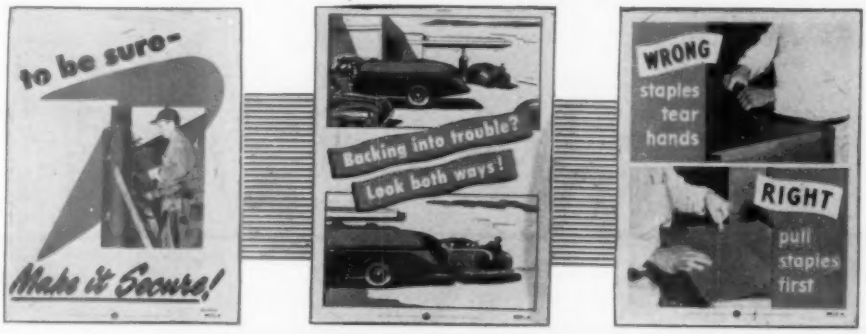
The current month's poster is illustrated in the poster section of the NATIONAL SAFETY NEWS. "C" posters may be purchased from month to month or by annual subscription.

PAYROLL ENCLOSURES

Miniature black and white reproductions of safety posters may be ordered for use as inserts in pay envelopes. You select 12 different posters from those shown in black and white in this directory or in NATIONAL SAFETY NEWS. (Do not select posters shown in color.)

The enclosures are printed 12 to a sheet and then cut to 1¾" x 2½" size. Minimum order of 1200 enclosures (100 sheets) is required. Quantities of each of the miniatures selected must be identical. Order by poster number. First 100 sheets $10.00—each additional 100 sheets $1.70.

NOTE: Payroll enclosures cannot be shipped between November 1 and December 31, so please plan your ordering accordingly.



- *SELECT POSTERS OBJECTIVELY.*
- *PLACE POSTERS STRATEGICALLY.*
- *DISPLAY POSTERS ATTRACTIVELY.*
- *CHANGE POSTERS FREQUENTLY.*

MEMBER PRICES

	1 to 9	10 to 99	100 to 999	1000 or more
"A" posters (8½" x 11½"), each	$0.08	$0.045	$0.04	$0.03
"B" posters (17" x 23"), each	.16	.14	.12	.09
"C" posters (25" x 38"), each	.32	.28	.24	.18
Subscriptions, 12 issues, each	3.20	2.80	2.40	1.80
Poster Frames, "A" size, each	1.00	.90	.80	.80
"B" size, each	1.50	1.25	1.00	1.00
Directory of Occupational Safety Posters	.50	.40	.35	.35
Jumbo Posters, subscriptions, each	42.50	40.00	38.00	38.00
Subscription on monthly billing, each	4.25	4.00	3.80	3.80

Non-member prices are double.

POSTERS ARE THE MASS ADVERTISING AND SELLING MEDIUM FOR YOUR SUSTAINED SAFETY PROGRAM.

OCCUPATIONAL SAFETY SERVICES

EMPLOYEE *Training*

SAFETY INSTRUCTION CARDS

Safety Instruction Cards are 3" x 5" vertical cards listing safe practices and information for workers and supervisors. Each card ticks off, point by point, accepted methods of performing a specific operation. Most cards are illustrated.

Safety Instruction Cards are inexpensive aids for checking specific hazards. Use cards for quick campaigns to correct specific unsafe practices. Pass out selected cards for discussion at safety meetings. Give each supervisor and foreman a set of cards consisting of all general safety cards and all the specialized cards that pertain to his work. Many of the cards are suitable for distribution in pay envelopes.

Every safety supervisor should have a set of Safety Instruction Cards available for reference purposes. It is a handy file of safety data . . . a rapid method of hazard detecting . . . a collection of complete, concise safety check lists right at his fingertips. A file set is a valuable source of information when you are called on to make a safety speech, write articles or fillers for plant papers and bulletins, prepare job analyses and job instructions, or plan plant or departmental safety meetings.

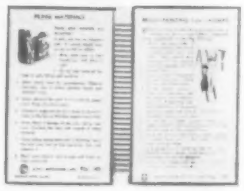
The Basic Industrial cards consist of 465 industrial cards of interest to every industry. The Special Industries Cards apply to specific industries. Non-Industrial Cards include motor transportation and off-the-job safety.

- A complete set consists of all the cards listed, approximately 690 in all.
- The Industrial Set consists of all the basic industrial cards plus those Special Industries Cards which apply to the purchaser's own industry. The Non-Industrial Cards are not included with the Industrial Set, but may be ordered by special purchase.

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Safety Instruction Cards, each ..... *5000 or more, $0.0125.	$ .05	$ .023	$ .017	$ .015*
Complete Sets, each	11.50	11.00	10.50	10.00
Industrial Sets, each	7.50	7.00	6.50	6.00

Non-member prices are double.

a Basic industrial cards



Chemicals, gases, flammable liquids

SUBJECT	Card No.
Acetone	616
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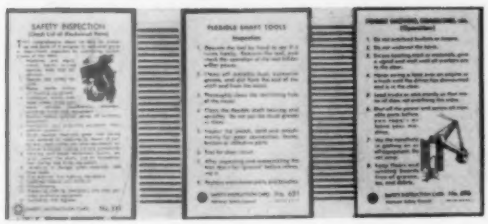
● **ORDER A SET** FOR EACH OF YOUR PLANTS EMPLOYING A FULL-TIME OR PART-TIME SAFETY SUPERVISOR



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● YOU SAVE TIME AND MONEY WITH A COMPLETE CARD FILE

OCCUPATIONAL SAFETY SERVICES

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MOTOR *Transportation*

A COMPLETE SERVICE

The majority of the materials pictured on these two pages can be provided regularly to your drivers through the Council's Motor Transportation Service. The Tables on the opposite page show the exact service you will receive, and the cost. Industrial, Transportation, and Insurance members base their driver charge on the reduced rates shown in the right-hand column.

FOR EXPERTS ONLY

A handsome three-color booklet that sells drivers on keeping a perfect no-accident record. Gives the rules for qualifying for the National Safety Council Safe Driver Award, and stresses the safety measures that must be taken to stay clear of the situations that cause accidents. 24 pages, size 5½" x 8½".

PUBLIC SAFETY

A popular monthly magazine covering current fleet safety problems and other phases of safety in street and highway traffic. Features articles by recognized fleet and traffic authorities. "Must" reading for the fleet supervisors. Size 8" x 11". Sold on annual subscription. Non-member prices same as member.

SAFE DRIVER AWARD

Qualified drivers employed by members using the Motor Transportation Service receive this gold-plated award. It is considered the badge of expert drivers. Holders regard it as a symbol of achievement. Available in three forms: cap and lapel pin, or key chain. Not for sale.

SAFE DRIVER

This popular pocket-size publication is issued monthly for regular distribution to drivers. Written for drivers in language they understand and enjoy. Drivers enjoy the clever cartoon-illustrations; like the common sense approach to safe driving. 16 pages, size 3⅜" x 6". May be imprinted.

Safe Driver

Safe Driver Award

Public Safety

For Experts Only

FLEET SAFETY MEMOS

1. List of Fleet Safety Memos, Public Safety Memos, and Safe Practices pamphlets of interest to fleet safety directors, 1948.
2. How ot Use Vehicle Safety Posters, 1947.
3. Publicity Procedure When Presenting Safe Driver Awards, 1946.
6. An Inter-Fleet Safety Contest, 1946.
10. Protective Coloring for Vehicles, 1946.
13. Safety Meetings for Commercial Drivers, 1946.
14. National Safety Council Safe Driver Awards, 1947.
15. Rules of the National Fleet Safety Contest, 1947.
17. Hand Signals and Vehicle Turn Indicators, 1947.
18. Investigating Commercial Vehicle Accidents, 1947.

Single copies, $.15. Quantity prices vary with number of pages. Write for quotations.

DEFENSIVE DRIVING

Popular 24-page booklet that combines good fun with sound tips on good driving. Cartoon illustrations picture the folly of aggressive or careless driving habits. Tells drivers that preventing accidents is not so much the knack of squeezing out of tight spots as it is the ability to anticipate and avoid such situations in the first place. Reminds drivers that safe, courteous driving is good public relations. Size 3"x5". Specify "Truck" or "Bus."

Separate editions for truck and bus operators.

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
For Experts Only, each	$0.20	$0.18	$0.15	$0.13
Safe Driver, subscriptions (12 issues) each	.65	.60	.45	.38*
Public Safety, subscriptions (12 issues) each	3.75	3.45	3.15	3.15
Defensive Driving, each	.15	.09	.07	.05

*QUANTITY PRICES SAFE DRIVER

5,000 to 9,999	$0.36 ea. per yr.	Single issues
10,000 to 19,999	.34 ea. per yr.	1/10 ANNUAL RATE
20,000 or more	.32 ea. per yr.	

1/10 ANNUAL RATE

(add $0.50 for foreign except Canada and Pan American Union)

Non-member prices are double member prices.

OCCUPATIONAL SAFETY SERVICES

MOTOR *Transportation*

Complete Transportation Membership

ANNUAL DUES

No. of Drivers	Service per Driver (For organizations holding Industrial, Insurance or Transportation company membership*)
1 to 9	$20.50 (per fleet, minimum charge)
10 to 19	2.20
20 to 29	1.90
30 to 49	1.60
50 to 74	1.45
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100 to 199	1.20
200 to 399	1.10
400 to 699	1.05
700 to 999	1.00
1000 to 1999	.90
2000 to 4999	.85
5000 or more	.80

*These rates do not apply for insurance agency members.

ACCIDENT RECORDS AND FORMS

Order by number and titles.

VEH- 1—Commercial Vehicle Report (8½" x 11" 2 sides).
VEH- 2—Accident Report Package Envelope (4¾" x 8" 2 sides)
VEH- 3—Commercial Vehicle Driver Record Card (8½" x 11" 2 sides).
VEH- 4—Commercial Vehicle Accident Analysis (8½" x 11" 1 side).
VEH- 5—Commercial Vehicle Accident Analysis (Long Form) (11" x 16½" 1 side).
VEH- 6—Award and Accident Record (5" x 8", 2 sides).
VEH-10—Safe Driver Award Record Card (10¼" x 16" 1 side).
VEH-12—Witness Card (3" x 5" 1 side)

EXPERTS DON'T SKID

Cartoon-illustrated leaflet presenting sound tips on safe winter driving. Tells drivers to: get feel of road; adjust speed to conditions; use chains; keep wind shield clear; pump brakes; follow at safe distance. Prepared by Committee on Winter Driving Hazards. 4"x6".

DASH CARDS

Colorful 3"x6" cards, illustrated and carrying a safety message. Subscription provides 24 cards, printed on both sides—enough for 4 changes per month. Metal holders that may be attached to the dashboard are furnished without charge. Specify "Bus" or "Truck".

DRIVER LETTERS

Monthly letters on Council letterheads, cartoon illustrated, and aimed at high-frequency accident causes. Council envelopes will be furnished if you wish to mail to drivers' homes. Sold an annual subscription basis only (12 issues).

SERVICE TABLE

Number of Drivers	1 to 9	10 to 49	50 to 99	100 or more
1. Fleet Manual, as issued (large)	—	1	1	1
Fleet Manual, as issued (small)	1	—	—	—
2. Automatic Posters				
No. of 8½x11-inch posters, monthly	2	2	4	8
No. of 17x23-inch posters, monthly	2	2	4	8
3. Public Safety Magazine, monthly	1	1	1	1
4. Sectional Enrollment				
No. of Sections	1	2	2	2
5. Sectional News Letters				
No. of Copies, monthly	1	2	2	2
6. Accident Facts, annually	0	1	1	1
7. Accident Rates Pamphlet, annually	0	1	1	1
8. Congress Transactions, annually				
General	1	1	1	1
Section Meetings	1	2	2	2
9. National Safety Calendar	1	1	1	1
10. Safe Driver Magazine		One Monthly Copy for Each Driver		
11. Safe Driver Awards		One Annually for Each Eligible Driver		
12. For Experts Only (Award Rules)		One copy for each Driver first year and one copy for every 5 Drivers in subsequent years		
13. Driver's Letter, monthly		One Monthly Copy for Each Driver		
14. Participation in the National Fleet Safety Contest		Contest begins July 1 each year and runs to June 30 of following year.		

MEMBER PRICES	1 to 9	10 to 99	100 to 999	1000 or more
Accident Record Forms, VEH-1, VEH-4, VEH-6, VEH-12, ea.	$0.05	$0.02	$0.015	$0.013
VEH-3, each	.05	.03	.025	.02
VEH-2, VEH-5, each	.10	.05	.038	.038
VEH-10, each	.20	.15	.12	.10
Driver Letters, subscriptions (12 issues), each	.45	.35	.25	.23
Dash Cards, sets, each	.60	.50	.38	.35
Experts Don't Skid, each	.05	.018	.015	.013
Complete Manual (four parts), each	5.00	5.00	5.00	5.00
Replacement Binders, each	2.60	2.60	2.60	2.60
Individual parts, each	.75	.65	.60	.55

Non-member prices are double member prices.

• FLEET SAFETY MANUAL

Replaces the large fleet manual. Consists of four parts in a binder. Fleet Safety Program—a general discussion of accident prevention techniques and how they may be organized into a safety program. Selection of drivers, Driver Training, and Accident Reports and Records—a recommended system of recording and analysis including sample forms. Individual parts may be ordered separately. 8½" x 11".

MOTOR TRANSPORTATION FILMS

35mm SOUND SLIDEFILMS

53. Defensive Driving Dramatizes the principles of defensive driving—keeping equipment in safe condition, follow at safe distances, stop slowly, use hand signal, brake at safe distance, drive courteously.

54. If It Happens Tells what to do in case of an accident—1. Keep the accident from getting worse; 2. Get and record all the facts; 3. Get you and your vehicle back on job as soon as possible. Many other tips.

55. Pilots of the Highway Moves from the first interview through training program to time driver becomes full-fledged "pilot of the highway." Tells of the many things a professional driver has to learn.

56. P. U. D. Driver Wins Again Typical day in the life of a pick-up and delivery driver. Shows how professional driver resists temptation to exceed speed limits, neglect hand signals, turn from wrong lane.

16mm SOUND MOTION PICTURES

64. The Operator and Safety discusses safety measures for city bus operators: what safety checks should be made, safe following distance, passing, etc.

65. The Truck and the Driver illustrates safe driving practices both in cities, and on county highways. Covers many phases of truck operation and maintenance.

66. They Drive in Safety is a training film that shows the requirements for commercial vehicle drivers. The running time is 12 minutes.

67. It's a Big Job An induction film for streetcar and bus employees, shows the prospective operator a preview of his job: what it calls for, and what it offers.

MEMBER PRICES	PURCHASE PRICE			PREVIEW AND RENTAL SERVICE (Shipped Prepaid—Return Prepaid)		
	Single Copy	2-9 Copies	10 or more	Day	2nd Week	Week
Films No. 53 to 56	$18.00	$17.00	$16.00	$3.00	$5.00	$3.00
Films No. 64 to 67		Rental Only		3.00	5.00	3.00

Non-member prices are double member prices.

Preview and rental service is available only within continental limits of the United States.

CONDITIONS AND TERMS

Prices shown in this catalog are effective March 1, 1950, payable U. S. Funds. They are subject to change without notice.

All prices shown are based on a single order for delivery in one shipment to one destination (one shipment per month on annual subscriptions). Quantities are not cumulative over a period of time, or for a number of locations, to obtain quantity prices.

On a single order requesting shipment to more than one location, the price per copy shall be the listed price in the group bracket in which each shipment falls. (Example: Order requesting shipment of 10 copies to each of 19 locations. The total cost of the order will be — 19 (locations) x 10 (copies) x price per copy in each group (10 to 99).

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All prices unless otherwise shown are pre-paid destination within the United States and Canada and Pan American Union. Customs charges will not be paid by the Council. An additional charge equal to 4% of the order will be made on shipment to foreign countries.

•

Terms of payment on all invoices are 30 days net, except quantity calendar purchases. Annual subscriptions payable in advance.

•

Remittance should accompany all orders totalling one dollar or less to conserve labor and speed up handling of the order.

•

Single copies of monthly publications—12 issues annually —can be purchased at 1/10 the annual subscription rate.

•

Special sorting or packaging, trimming to special sizes, or other special handling of publications will, wherever possible, be performed as requested. Service charges will be made for the cost of such work.

IMPRINTING CHARGES

In general, imprinting is limited to three lines. On large posters, imprinting is limited to the right hand half of the lower margin.

It is understood that a quantity within 4% above or below the quantity requested will constitute an acceptable delivery on any order requiring imprinting.

•

Imprinting at time of publication:

Safe Driver, Safe Worker, and all other publications imprinted at time of publication (except calendars), regardless of quantity—per lot or per month on monthly publications $3.50

On monthly publications, the per lot-per month charge of $3.50 is effective only when the imprint remains the same during the period of subscription.

•

Imprinting after publication:

Small posters (8½"x11½")—1st 1,000 or fraction $4.50
additional 1,000 or fraction 3.50

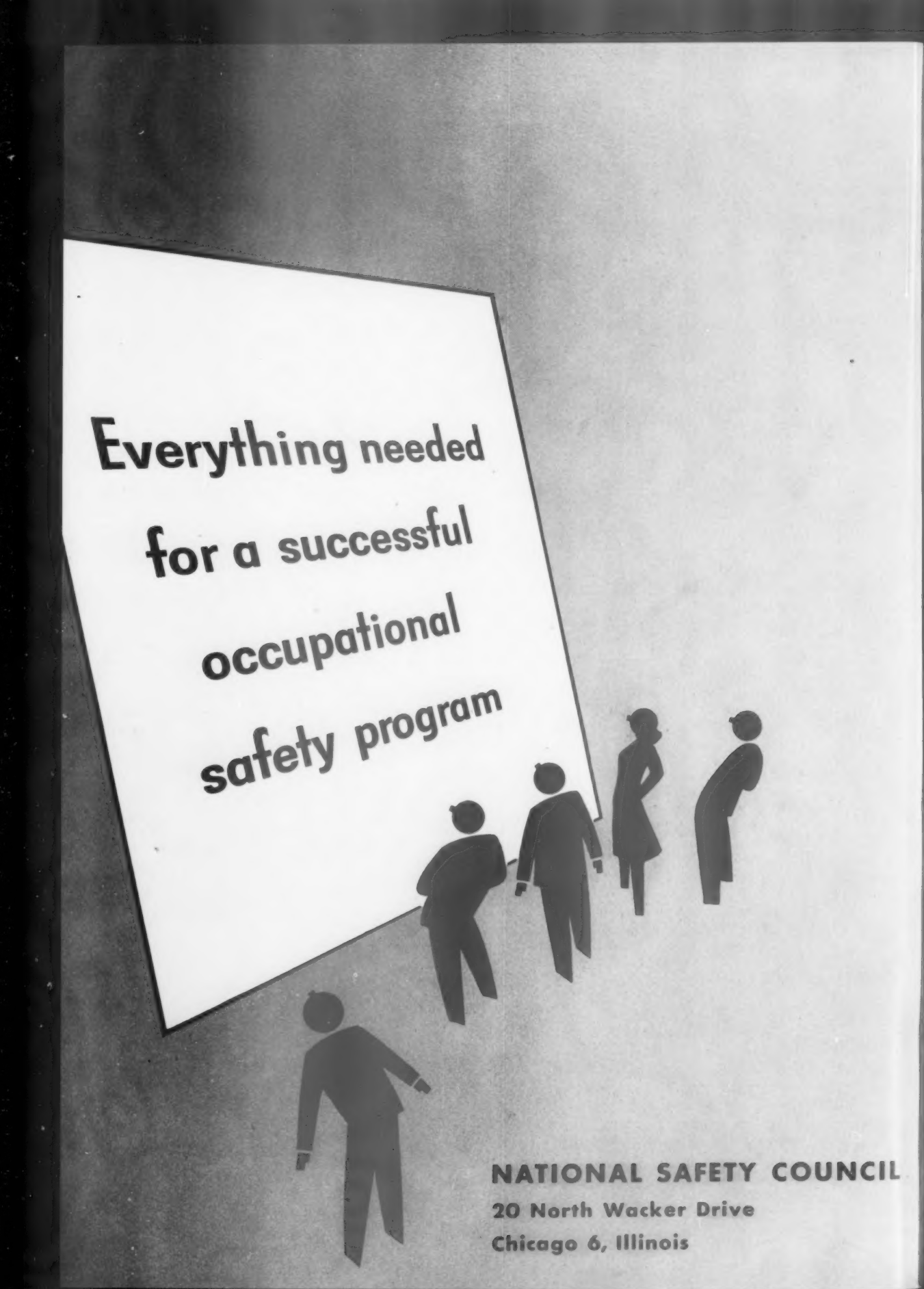
Large posters (17"x23")—1st 1,000 or fraction $10.00
additional 1,000 or fraction 7.50

Other Publications imprinted after publication, where space permits—1st 1,000 or fraction $7.00
additional 1,000 or fraction 3.00

•

Posters presented in four-colors or without a white border cannot be imprinted. Imprinting can be done on all Council publications (outside front and back covers only) provided there is sufficient space and a light background color.

OCCUPATIONAL SAFETY SERVICES


Everything needed
for a successful
occupational
safety program
NATIONAL SAFETY COUNCIL
20 North Wacker Drive
Chicago 6, Illinois

Plant Defense

(From page 164)

to minimize the danger of freezing in cold weather. Hydrants should be kept clear of snow and a thawing device provided.

Standpipe and hose provide effective protection inside buildings when used by men trained in handling heavy streams. They are a valuable auxiliary to the city fire department. Piping should be of sufficient size for buildings of more than four stories.

Couplings. All outside hydrant nipples and hose couplings should be of the American (National) Standard 2½-inch fire hose thread.

For outside use, 2½-inch single-jacketed rubber-lined hose is ordinarily used. It is flexible and light in weight. Double jacket hose is used principally for the rougher service in municipal fire departments.

Rubber covered hose is sometimes needed where there is exposure to fumes or corrosive liquids. Synthetic rubber has been found superior to the natural variety for fire hose.

The use of 1½-inch hose is increasing and it is of great value for small fires and for wetting down fires after the blaze is under control. It can be handled easily by one or two men.

Playpipes and nozzles. Standard underwriters' playpipes are commonly used. They throw an effective stream but are difficult to handle, particularly on ladders. The short rigid playpipes with strap and ladder hook are more suitable for plant use with shut-off nozzles to prevent excessive water damage.

Fire Doors and Shutters. For large buildings, fire-resistive partitions with fire doors are important in confining fire to a limited area. Several types of doors with varying degrees of resistance have been approved by recognized testing laboratories.

Fire doors should either close automatically each time they are opened or by some heat-actuated device if fire should break out. The most common device is the fusible link.

The releasing device should be located where it will be affected quickly by heat passing through the doorway and it should be protected against mechanical injury.

Where flash fires may occur, quick operating devices are preferable, except for doors used as exits.

Fire shutters are used for windows where there is an exposure hazard from adjacent buildings. Shutters may be of the swing type (tin clad or steel) or rolling steel. The latter type can be installed where space is too limited for swinging shutters. Sliding shutters are not recommended where snow and ice might interfere with their operation.

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GC-3 . . . 7¾" x 7¼"—A beautiful two-tone jewelers bronze etching with "Green Cross for Safety" in color, mounted on a genuine walnut shield, only $6.50.

Engraving @ 6¢ per letter.

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Automatic Protection

(From page 157)

obstruction in system, corrosion, obstruction of sprinkler heads by stock piles, faulty installation, or paint on the working parts of the sprinkler heads.

Special Systems

For special risks, automatic systems employing carbon dioxide, foam or water spray nozzles may be installed.

Carbon dioxide is particularly desirable where the system operates in an enclosed space and the value of the contents is high and subject to water damage. Carbon dioxide is discharged manually or by means of heat-actuated devices. Devices are also provided for closing shutters, doors, windows and dampers and stopping blowers to confine the extinguishing gas. These systems are suitable for spaces containing electric equipment or flammable liquids.

Foam installations are suitable for tanks and operations involving flammable liquids but not for electric fire hazards. They are usually arranged to operate automatically with provision for manual operation.

Water spray systems are used to protect oil-filled electric equipment, such as transformers, oil switches and oil piping and open tanks of flammable liquids. To be effective, water spray systems require expert installation.

Protective Lighting. Ample light where men are at work is an aid to protection as well as production. Departments not operating at night should have enough light so that guards can patrol them without depending entirely on flashlights and lanterns.

Portable floodlights should be available in case of power failure.

Extinguishers

(From page 168)

with the carbon tetrachloride to form hydrochloric acid which does the damage.

The vaporizing liquid furnished by manufacturers is treated to remove impurities and has ingredients added to depress the freezing point.

Before recharging soda acid and foam extinguishers, the shells and all parts should be thoroughly rinsed with warm water.

Protection from Freezing. Carbon dioxide, vaporizing liquid and dry chemical extinguishers will not freeze.

Soda-acid and foam extinguishers should be installed in heated cabinets.

Gas cartridge extinguishers, pump tanks and fire pails use calcium chloride solutions.

Safety and Service Emblems

Fewer accidents mean more manpower. Safety Emblems for various lengths of "no lost time" service instill the competitive spirit necessary for employee cooperation.

Service Award Emblems for 1, 3, 5, 10, 25 and 50 years of continued employment increase loyalty and reduce labor turn-over.

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Safety First Supply Co.
Standard Safety Equipment Co.
U. S. Safety Service Co.

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Chicago Eye Shield Co.
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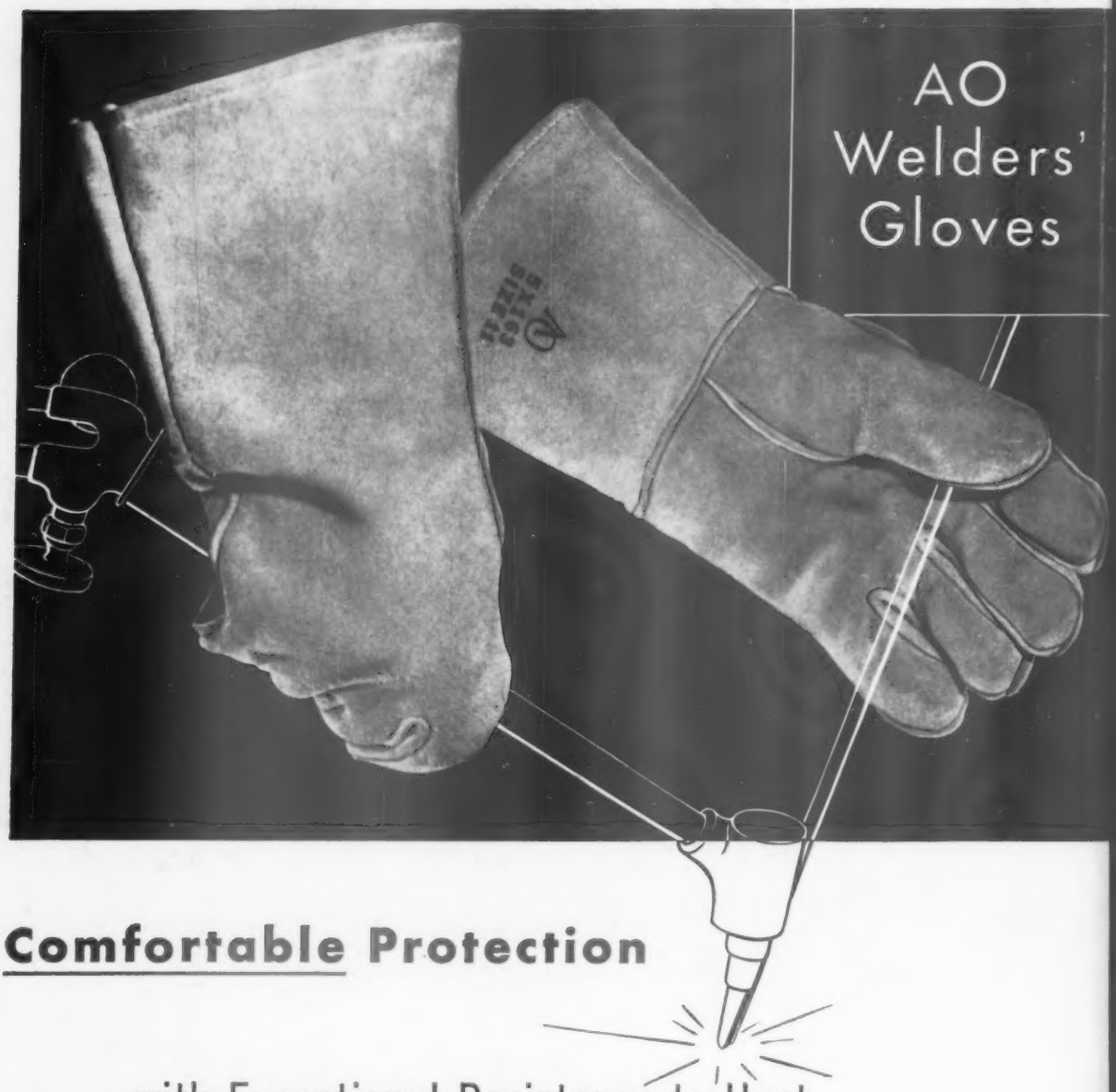

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